



PinPoint-E EV-DO



User Guide



AirLink Communications, Inc.

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WARNING

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

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Because of the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the AirLink Communications modem are used in a normal manner with a well-constructed network, the AirLink modem should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. AirLink Communications, Inc., accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the AirLink Communications modem, or for failure of the AirLink Communications modem to transmit or receive such data.

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Introduction to PinPoint-E EV-DO

The PinPoint-E's rugged form factor is ideal for industrial and commercial applications that require real-time communications. The PinPoint-E provides cellular data communications for a variety of applications, such as telemetry, public safety, SCADA, traffic control, traffic metering, transit arrival systems and more.

In addition to the primary broadcast and receive antenna port (TNC ANT1), the PinPoint-E EV-DO is equipped with a secondary receive diversity antenna port (SMA ANT2). While use of the receive diversity antenna is optional, receive diversity can provide improved bandwidth throughput and increased coverage, particularly in fringe network areas or mobile environments. Receive diversity also optimizes performance to help lower power consumption and reduce heat build-up.



Caution: To work correctly, receive diversity requires the two antennas to be placed at least six inches apart.



Use of receive diversity is optional. Data transmission and reception will not be adversely affected if it is not used.

FIGURE 1. PinPoint-E front and back



EV-DO Overview

Evolution Data Optimized (EV-DO) provides a broadband-like cellular data connections that is up to 10 times faster than 1xRTT service. With the high-speed connection, users can experience faster downloading when accessing the Internet and retrieving e-mails, including large attachments and other bandwidth-intensive applications.

When EV-DO is not available, your PinPoint-E will fall-back to CDMA/1xRTT for it's connection to Verizon to provide continued connectivity.

Establishing a Internet Connection

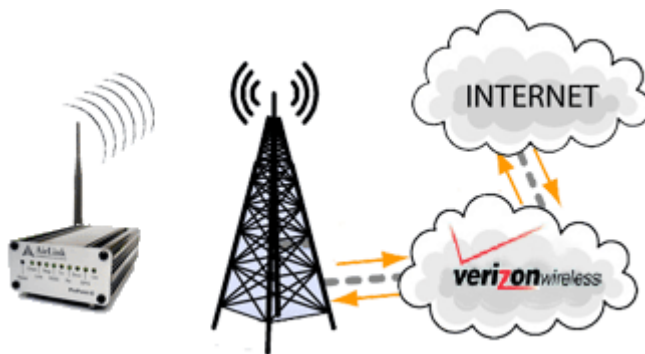
The Internet Service Provider (ISP) from you to the Internet is Verizon with your PinPoint-E as the connection to Verizon.

When your PinPoint-E is powered on, it automatically searches for cellular service using EV-DO and establishes a PPP (Point to Point Protocol or “dial” up connection) link to Verizon’s network. As soon as the PinPoint-E receives its IP, it’s ready to create a network between your computer or device and Verizon’s network so you can use Verizon to communicate on the Internet.

To use your PinPoint-E to connect to the Internet from your computer, you need to connect the computer directly to the PinPoint-E’s Ethernet port. The PinPoint-E

features DHCP (enabled by default) so you don't need to worry about setting up an IP address on your computer.

FIGURE 2. Using the PinPoint-E to connect to the Internet



Note: Private network connections are unique for each configuration and not covered as part of the standard installation.

Using EV-DO to Communicate with Your Equipment

There are two types of addresses in TCP/IP, dynamic and static.

- Dynamic addresses are assigned on a “need to have” basis. Your PinPoint-E might not always receive the same address each time it connects with Verizon.
- Static addresses are permanently assigned to a particular account and will always be used whenever your PinPoint-E connects to the Internet. The IP address will not be given to anyone else.

If you need to contact the PinPoint-E, a device connected to the modem, or a host system using the modem, you need to have a known IP (such as one which is static) or domain name (an IP address which is converted by a DNS server into a word based name).

Most ISPs (cellular included) use dynamic IP addresses rather than static IP addresses. A dynamic IP address is suitable for many common Internet uses, such as web browsing, looking up data on another computer system, or other client function (such as data only being sent out or only being received after an initial request).



Note: If you have a dynamic IP address for your PinPoint-E, you can use a Dynamic DNS service (such as IP Manager coupled with a Dynamic DNS Server, covered later in this User Guide) to translate a dynamic IP address to a fully qualified domain name so you can contact the PinPoint-E as if it had a static IP.



Caution: The IP address given to your PinPoint-E by Verizon must also be Internet routable if the computer you need to connect to the PinPoint-E is not connected directly to Verizon's IP network. Please check with Verizon to confirm your IP scheme is correct for your application and needs.

Common Uses for the PinPoint-E

The PinPoint-E's rugged construction and cellular connection make it ideal for use in remote and/or industrial locations.

Because of its GPS capabilities, the PinPoint-E is ideal for vehicle tracking and other situations where noting a moving location is as important as connecting to a network.

Activation of the PinPoint-E EV-DO

Your PinPoint-E needs specific parameters before it can operate on the EV-DO network. Generally Verizon will provide you with the necessary parameters to get the PinPoint-E configured.

Connecting the PinPoint-E to your computer

Your PinPoint-E's Ethernet port can be connected directly to most computers or devices using a cross-over cable.

Quick Start Guide and Setup Wizard

The preferred way to configure and activate your PinPoint-E is via the AirLink Setup Wizard for Verizon and EV-DO. The Quick Start Guide will lead you through the using the Setup Wizard.

- The PinPoint-E Setup Wizard for EV-DO and Verizon is available from the AirLink web site, <http://www.airlink.com/support>.
- The Quick Start Guide is also available at the AirLink web site.



Note: The web site may have a more recent Setup Wizard and Quick Start Guide than those included with your PinPoint-E. It is recommended that you check with the web site for the latest version before installing your PinPoint-E. You will need to look for Verizon, EV-DO, and the PinPoint-E. Other Setup Wizards may not work to connect you to Verizon.

To run the Setup Wizard, you will need the Microsoft .NET framework and Microsoft Windows 98, Microsoft Windows 2000, Microsoft Windows XP, or later.

1. Select **Start**.
2. Select **All Programs**.
3. Select **AirLink Communications**.
4. Select **Setup Wizard**.
5. Select **Setup Wizard**.

FIGURE 1. Setup Wizard



The Quick Start Guide specifies the information you need and will lead you through the steps.

Activating the PinPoint-E using AT Commands

An alternate method to configure and activate your PinPoint-E is by AT commands (full listing beginning on page 64) sent directly to the modem via a terminal application. This method is recommended only in situations where the Setup Wizard is not available and/or the configuration for the PinPoint-E is unusual.

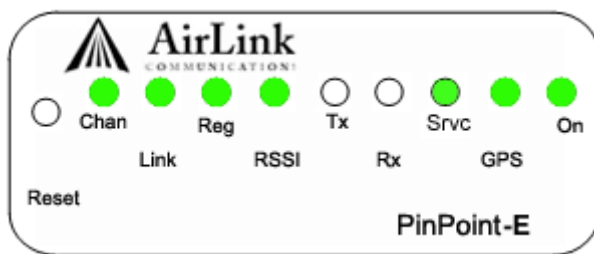


Caution: While you can configure your PinPoint-E using Wireless ACE (page 10) or AceNet (page 11), it is not recommended to activate the PinPoint-E using either Wireless ACE or AceNet.

PinPoint-E Indicator Lights

When your PinPoint-E is connected to power and an antenna, there is a specific pattern to the lights to indicate its operation mode.

FIGURE 2. PinPoint-E indicator lights



Tx (transmit) and **Rx** (receive) - Lights will flash as data is transferred to and from the PinPoint-E on the remote network.

RSSI - Light shows the strength of the signal and may be nearly solid (strong signal) or flashing (weaker signal). A slow flash indicates a very weak signal.

Reg - Indicates the PinPoint-E has acquired an IP from Verizon.

Chan - Indicates the modem has acquired a network channel.

Link - Indicate a successful connection to the cellular network.

Srvc - Indicates when the connection is EV-DO. Unlit indicates CDMA.

Pwr - Indicates the power adapter is connected and there is power getting to the modem.

The **Reset** button performs the same function as unplugging power from the modem and plugging it back in. Reset will not alter any saved configuration settings.

AirLink offers a suite of utilities to optimize your PinPoint-E's performance, allowing you to remotely view status and make changes to the configuration as needed.

- Wireless ACE 3G
- AceNet
- Modem Doctor
- AirLink Tracking System

This section of the PinPoint-E User Guide covers basic information about these utilities. For additional information on a specific utility, please refer to the user guide for that utility.

These utilities, except AceNet and AirLink Tracking System (ATS), are free of charge to those who own AirLink modems. You can download the utilities and their user guides from the AirLink web site: <http://www.airlink.com/support>. Contact your dealer or AirLink representative for information on AceNet and ATS.



Note: Wireless ACE 3G, and AceNet require the Microsoft .NET Framework and Microsoft Windows 98, Windows 2000, Windows XP, or later.



You can obtain the Microsoft .Net Framework, Microsoft Internet Explorer, and/or the latest ActiveX updates for Internet Explorer from Microsoft at: <http://www.microsoft.com/>.

AirLink Configuration Executive (ACE)

The AirLink Configuration Executive provides a user friendly interaction with ALEOS, the brains of your PinPoint-E.



Wireless ACE 3G

Wireless ACE 3G allow you to monitor your PinPoint-E either remotely or locally with a direct connection to the modem.



Note: Most configuration screen shots in this guide are using Wireless ACE 3G.

FIGURE 1. Wireless ACE 3G

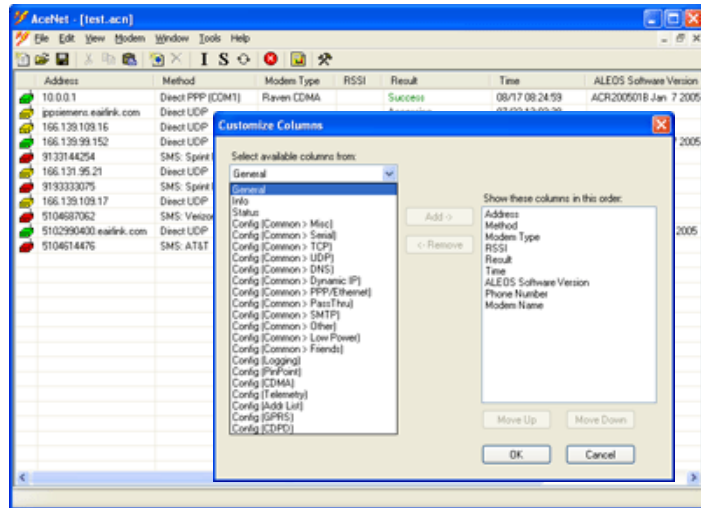
AT	Name	Value
*NETPHONE	Phone Number	5306327652
*DEVICEID	Device ID	0x0000021200608064
	Modem EID/IMEI	09900925827
	Modem Type	Raven
!1	ALEOS Software Version	ACR2005018 Jan 7 2005
	ALEOS Hardware Version	000207500001000000000000000000
	Boot Version	2.0.1
	Modem Software Version	R2_1_0_658_V2W_S_H_FJ/585555TD/ROSETTA 2003/07/22 14:22:04
	Modem Hardware Version	011
	MSCI Version	JS



AceNet

With AceNet you can monitor several AirLink modems at the same time. The modems can be connected locally or remote. Several features can be displayed and logged. AceNet is a separate product which can be purchased from AirLink.

FIGURE 2. AceNet



Using a template from Wireless ACE, you can change the configuration in several modems at the same time and can check and update their firmware as well. AceNet also features logging to a database and charting for the monitored modems.

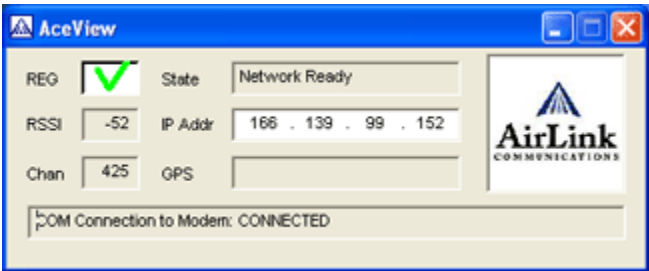
With AceNet, you can connect to modems locally or remotely with TCP/IP or SMS.



AceView

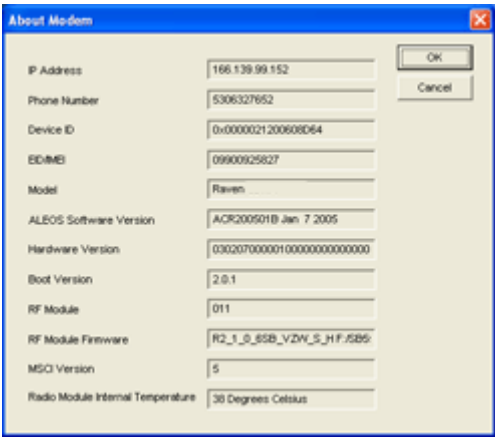
AceView is a low-profile monitoring tool to view the status of your AirLink PinPoint-E and display network status, IP address, RSSI strength, firmware version, and other basic information.

FIGURE 3. AceView



You can connect to your PinPoint-E locally or remotely using a known IP address or a fully qualified domain name. The display is updated periodically as AceView polls the PinPoint-E at a specified interval. *GPS is available only for PinPoint and PinPoint-E modems.*

FIGURE 4. AceView: About Modem

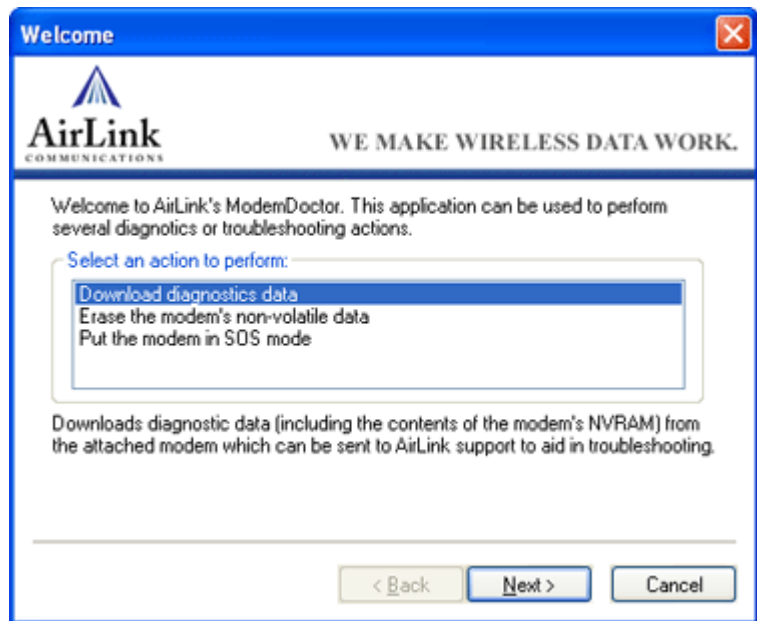




Modem Doctor

Modem Doctor is a troubleshooting utility. This utility will allow you to get a log file of the PinPoint-E activity which you can then send to AirLink support, erase the current configuration completely, and temporarily set the PinPoint-E to a known serial configuration to aid in trouble shooting.

FIGURE 5. Modem Doctor



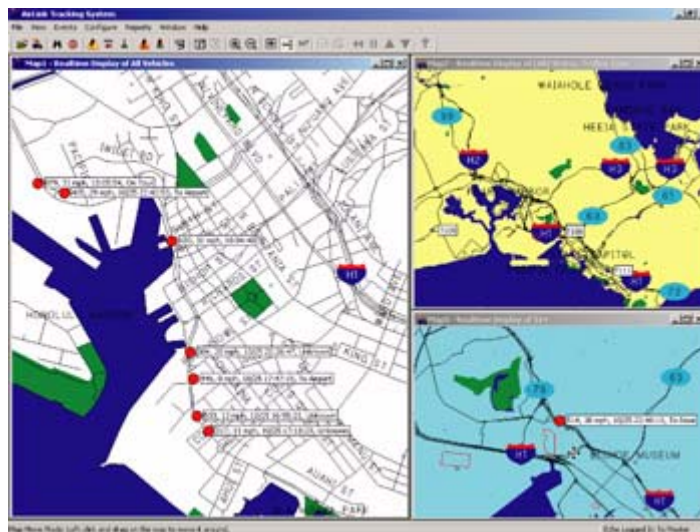
AirLink Tracking System (ATS)

The AirLink Tracking System (ATS) is a feature-rich vehicle tracking system that uses cellular technology to transmit vehicle and location information to a Tracking

Control console. ATS also employs the satellite based Global Positioning System (GPS) to obtain location and velocity information.

ATS is a separate product which can be purchased from AirLink.

FIGURE 6. AirLink Tracking System



IP Manager translates a dynamic IP address to a fully qualified domain name so you can contact your PinPoint-E by name as if it had a static IP.

Since Wireless Service Providers frequently do not offer static IP addresses, IP Manager is a free service provided by AirLink for your PinPoint-E to translate a dynamic IP address into a fully qualified domain name so it can be contacted directly on the Internet.

- Dynamic IP addresses are granted only when a modem or other device is connected and can change each time the modem or device reconnects to the network.
- Static IP addresses are granted the same address every time the modem or device is connected and are not in use when the associated device is not connected.

A dynamic IP address is suitable for many Internet activities such as web browsing, looking up data on another computer system, data only being sent out, or data only being received after an initial request. However, if you need to contact the PinPoint-E directly, a device connected to the modem, or a host system using the PinPoint-E, a dynamic IP won't give you a reliable address to contact (since it may have changed since the last time it was assigned).

Fully Qualified Domain Name

A fully qualified domain name (FQDN) generally has several parts.

- **Top Level Domain (TLD):** The TLD is the ending suffix for a domain name (.com, .net, .org, etc.)
- **Country Code Top Level Domain (ccTLD):** This suffix is often used after the TLD for most countries *except the US* (.ca, .uk, .au, etc.)
- **Domain name:** This is the name registered with ICANN (Internet Corporation for Assigned Names and Numbers) or the registry for a the country of the ccTLD (i.e. if a domain is part of the .ca TLD, it would be registered with the Canadian domain registry). It is necessary to have a name registered before it can be used.
- **Sub-domain or server name:** A domain name can have many sub-domain or server names associated with it. Sub-domains need to be registered with the domain, but do not need to be registered with ICANN or any other registry. It is the responsibility of a domain to keep track of its own subs.

A URL (Universal Resource Locator) is different from a domain name in that it also indicates information on the protocol used by a web browser to contact that address, such as <http://www.airlink.com>.

- **.com** is the TLD
- **airlink** is the domain (usually noted as [airlink.com](http://www.airlink.com) since the domain is specific to the TLD)
- **www** is the server registered with [AirLink.com](http://www.airlink.com)
- **http://** is the protocol (html or web) used to access the webpage for AirLink

Dynamic Name Resolution

When an IP address is not expected to change, the DNS server can indicate to all queries that the address can be cached and not looked up for a long period of time. Dynamic DNS servers, conversely, have a short caching period for the domain information to prevent other Internet sites or queries from using the old information.

If the PinPoint-E is configured for Dynamic IP, when the PinPoint-E first connects to the Internet, it sends a IP change notification to IP Manager. IP Manger will acknowledge the change and update the DNS record. The changed IP address will then be the address for the PinPoint-E's configured name.

Once the PinPoint-E's IP has been updated in IP Manager, it can be contacted via name. If the IP address is needed, you can use the domain name to determine the IP address.



Note: The fully qualified domain name of the PinPoint-E will be a subdomain of the domain used by the IP Manager server.



As a free service, Airlink maintains an IP Manager server which can be used for any AirLink modem. The domain is earlink.com and is used in all the samples below.

Configuring the PinPoint-E for Dynamic IP

To configure the Dynamic IP settings in your PinPoint-E so that it will use IP Manager, you can use AT commands (page 64), using direct serial communication or Telnet, Wireless ACE (page 10), and ACE Net (page 11) using a template built from Wireless ACE.

To configure your AirLink modem to be addressed by name, the modem needs to have 4 elements configured.

In Wireless ACE, select **Dynamic IP** to configure your modem to use IP Manager.

FIGURE 1. Wireless ACE: Dynamic IP (IP Manager configuration)

*MODEMNAME	Modem Name	dogwatcher1	dogwatcher1
*DOMAIN	Domain	eairlink.com	eairlink.com
*IPMANAGER1	IP Manager Server 1 (IP Adrs)	eairlink.com	eairlink.com
*IPMGRUPDATE1	IPMServer1 Update (Minutes)	0	0
*IPMANAGER2	IP Manager Server 2 (IP Adrs)		
*IPMGRUPDATE2	IPMServer2 Update (Minutes)	0	

1. **Modem name:** The name you want for the modem.
2. **Domain:** The domain name to be used by the modem.
3. **IP Manager IP Address:** The IP or domain name of the dynamic DNS server which is running IP Manager.



Note: To use the name here instead of the IP, you need to have DNS set up in your PinPoint-E (page 19).

4. **IP Manager update interval:** How often you want the address sent to IP Manager. If this is set to zero, the modem will only send an update if the IP changes (i.e. if the modem is reset or is assigned a different IP).

You can configure a second dynamic server as a backup, secondary, or alternate server.



Note: For the Modem Name, you should use something which is unique but also easy to remember. Your company name or the intended function of the modem are recommended. If you have more than one modem, you can append a number for each.

Restrictions for Modem Name

- Must begin with a letter or number
- Can include a hyphen (-)
- Cannot contain spaces
- Must be no longer than 20 characters total

DNS: Using Names Instead of IP addresses

A domain name is a name of a server or device on the Internet which is associated, generally, with an IP address. In a way, a domain name is like the street address of your house with the phone number being like the IP address. You can contact the house either by going to the address (name) or by calling the phone number (IP address).

Domain Name Service (DNS) is a network service which translates, or redirects, the IP address, allowing someone to contact that address via the name. A DNS server is registered to handle all addresses of a particular domain (much like the post office for a particular town or city is known to the post offices of all other towns and cities and is authorized to give the addresses of locations in its own location).

Configuring DNS

The PinPoint-E has an internal DNS resolver with which it can query DNS servers in order to translate names into IP addresses which it can then use internally. Generally, when your PinPoint-E receives its IP address from Verizon, it will also be configured to use Verizon's DNS servers to use for resolving (or translating) names to IP addresses. In that case, the only one which is not overwritten is the alternate DNS.

You can use AT commands (page 64), Wireless ACE (page 10), and ACE Net (page 11) using a template built from Wireless ACE to configure DNS in your PinPoint-E.

FIGURE 2. Wireless ACE: DNS

*DNS1	Modem DNS Server 1	0.0.0.0	66.174.6.7
*DNS2	Modem DNS Server 2	0.0.0.0	66.174.3.7
*DNSUSER	Use Alternate DNS	0.0.0.0	0.0.0.0
*DNSUPDATE	DNS Updates	0	0-Disable

***DNS1** and ***DNS2** - Set these to your primary and secondary DNS servers. These may be overwritten by Verizon when your PinPoint-E gets its IP address.

***DNSUSER** - Set this, if desired, to an additional DNS server to query first before the primary or secondary (just as a hosts file is queried first on a computer). If ***DNSUSER** is set to 0.0.0.0, it will be ignored.

***DNSUPDATE** - This command sets how often you want DNS Updates to be forced. Otherwise the PinPoint-E will only send updates when it is reset, powered up, or the IP address granted by the network changes.



Note: If you will be using your PinPoint-E to communicate with another AirLink modem and both are using IP Manager to translate dynamic IP addresses to domain names, it is recommended that you set ***DNSUSER** to the IP address for IP Manager. IP Manager's updates occur more frequently than Verizon's DNS servers decreasing the time between IP address change and address resolution.

It is not uncommon for your PinPoint-E to be disconnected from Verizon after an extended period of inactivity. This is generally a feature intended to reduce your charges for inactive use.

Keepalive is used to test and maintain the PinPoint-E's connection to Verizon by pinging an IP address after a specified period of inactivity. Keepalive is recommended for users who have a remote terminated modem that infrequently communicates to the network. Keepalive is also recommended if you have experienced issues where the modem can no longer be reached remotely.

When Keepalive pings the IP address, an acknowledgement indicates there is an active connection to the network. If the modem does not receive a response from the IP address, it will retry 5 times in 5 second intervals. The PinPoint-E will then reset the radio module after 5 failed attempts and reconnect to Verizon.

Configuring Keepalive

As with all other aspects of the PinPoint-E's configuration, you can use Wireless Ace (page 10), AceNet (page 11), or Telnet (page 64) to configure Keepalive.

To set the Keepalive using Wireless ACE, select **Other** from the menu on the left.

FIGURE 1. Wireless ACE: Keepalive Configuration

AT	Name	Value	New Value
*IPPING	Keepalive Ping Time	0	60
*IPPINGADDR	Keepalive Ping Address		192.168.0.222

***IPPING** sets the interval, in minutes, you want Keepalive to test the network connection. To disable Keepalive, set *IPPING to 0 (default setting).



Note: 15 minutes is the minimum time which can be set for Keepalive.

***IPPINGADDR** sets the IP address you want to use for the test. If *PPINGADDR is left blank or is set to an invalid IP address (i.e. an IP which is unreachable or one which is not a valid IP address), the modem will reset itself on a regular interval.

Data usage using Keepalive

When using Keepalive, be aware that a ping moves approximately 66 bytes of data over the network and is billable by the carrier. The following *IPPING settings will incur approximate monthly data usage in addition to any other data usage:

15 minutes	400k / month
30 minutes	200k / month
60 minutes	100k / month
120 minutes	50k / month

External Inputs and Power Control

The PinPoint-E has special features for use in a mobile environment. The PinPoint-E can be configured to monitor the inputs on its serial port and respond to specific types of events. The PinPoint-E can also be configured to change its power mode in order to conserve power.

Capturing Events via External Inputs

The RS232 DB9 interface (the serial port) can be connected to digital switches and configured to capture contact closures using RTS and DTR to signal external or physical events (such as a tow bar being activated, opening a door or trunk, the car is turned on or off, etc.).

Setting the DTR and RTS

You can use either Wireless ACE (page 10), direct serial communication, or Telnet to configure the modem using AT commands (page 64).

In Wireless ACE, select **PinPoint** from the menu on the left.

FIGURE 1. Wireless ACE: DTR and RTS

RTSI	RTS Input Enable	0	1-ON
DTRI	DTR Input Enable	0	1-ON

To turn on the DTR (pin 4) digital sensing in the modem, *DTRI should be set to 1. To turn on the RTS (pin 7) digital sensing, *RTSI should be set to 1.



Note: To use only DTR or only RTS, you only need to configure the one you will be using.

Connecting to the Serial Port

You can connect a standard RS232 serial cable to the The PinPoint-E serial port. If you want to use the DTR switch, wire in a Normally Open switch between the **DTR (pin 4)** and **signal ground (pin 5)**, the PinPoint-E's external case, or the power ground (refer to the figures below). If you want to use the RTS switch, use **RTS (pin 7)** to the ground (can use the same ground as DTR).



Caution: Never apply voltage to the DTR or RTS inputs. DTR and RTS can only be switched open or closed to ground.

When the switch is closed, a GPS packet will be sent to the destination IP address indicating that a contact closure has taken place (an external physical event has occurred). See "RAP Configuration" on page 32.

FIGURE 2. PinPoint-E back

FIGURE 3. PinPoint-E Serial Port Pinouts

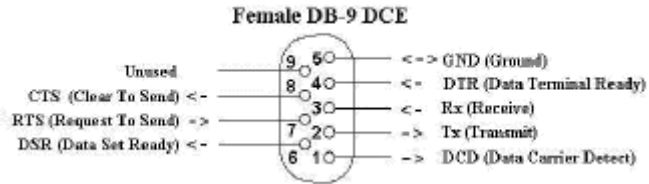
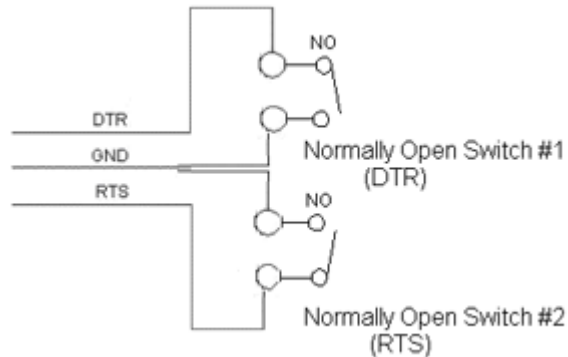


FIGURE 4. DTR and RTS switches using Pin 5 (signal GND) as the common ground (broche 5)



Power Modes

The PinPoint-E can be configured to switch a low-power mode in response to specific events in order to conserve a vehicle's battery life.

PinPoint-EThe PinPoint-E can power down when the voltage to the modem drops below a configured threshold (generally caused by the vehicle being turned off), or when DTR changes (commonly a contact or voltage controlled by the key switch, signaling when the vehicle is turned off).



Note: If one or both DTR or RTS have been configured to be used as digital inputs through the AirLink Tracking System (ATS), then low power mode cannot be configured to respond to DTR.

Power Effect on Modem State

Once the transition from powered on to low-power mode starts, the modem will change state to AT mode. This results in the current mode being gracefully terminated. For the brief period when the modem is preparing for low-power mode, the modem will remain in AT mode (i.e. won't auto-answer, ATD will fail, etc.). Once low-power mode is entered, the modem will then discard any data received on the host port.

When the modem is woken from low-power mode, the same behavior occurs as upon power on. The modem starts in AT mode, and then after 5 seconds will enter the default mode (See “Host Modes” on page 53).

Global Positioning System (GPS)

The PinPoint-E is equipped with a GPS receiver to ascertain its position to track the movements of a vehicle or other devices which move. The PinPoint-E relays the information of its location as well as other data for use with AirLink Tracking System (ATS) or other such tracking applications.

GPS Overview

The Global Positioning System (GPS) is a satellite navigation system used for determining a location and providing a highly accurate time reference almost anywhere on Earth. The US military refers to GPS as Navigation Signal Timing and Ranging Global Positioning System (NAVSTAR GPS).

GPS consists of a "constellation" of at least 24 satellites in 6 orbital planes. Each satellite circles the Earth twice every day at an altitude of 20,200 kilometres (12,600 miles). Each satellite is equipped with an atomic clock and constantly broadcasts the time, according to its own clock, along with administrative information including the orbital elements of its motion, as determined by ground-based observatories.

A GPS receiver, such as the PinPoint-E, generally receives signals from four satellites in order to determine its own latitude, longitude, and elevation. Using time synced to the satellite system, the receiver computes the distance to each satellite from the difference between local time and the time the satellite signals were sent (this distance is called pseudorange). The locations of the satellites are decoded from their radio signals and a database internal to the receiver. This process yields the location of the receiver. Getting positioning information from fewer than four satellites, using imprecise time, using satellites too closely positioned together, or using satellites too close to the Earth's curve will yield inaccurate data.

The GPS data is then transmitted to a central location which uses a tracking application to compile information about location, movement rates, and other pertinent data.

AirLink Remote Access Protocol (RAP)

The AirLink Remote Access Protocol (RAP) uses the User Datagram Protocol (UDP) and is a proprietary binary message format. RAP has been designed to work specifically with AirLink Tracking System (ATS), but other 3rd party applications have been developed to take advantage of the RAP messaging format. AirLink RAP is also referred to as AirLink Binary/ATS.

National Marine Electronics Association (NMEA)

National Marine Electronics Association (NMEA) is a protocol by which marine instruments and most GPS receivers can communicate with each other. NMEA defines the format of many different GPS message (sentence) types, which are intended for use by navigational equipment.

Trimble ASCII Interface Protocol (TAIP)

Trimble ASCII Interface Protocol (TAIP) is a digital communication interface based on printable ASCII characters over a serial data link. TAIP was designed specifically for vehicle tracking applications but has become common in a number of other applications, such as data terminals and portable computers, because of its ease of use.

Real-Time Clock Sync

Every hour, the PinPoint-E will sync the internal Real Time Clock (RTC) with the Coordinated Universal Time (UTC) received from the GPS satellites.

Applications, such as ATS and the Event Browser, will then translate the time reported by the PinPoint-E as part of the GPS message to the appropriate local time zone using the UTC offset (i.e. California is UTC-8 and New York is UTC-5).



Note: Wireless ACE displays the current time (UTC) set in the modem and does not translate it to the local time zone. If the modem is in California and it is 8 a.m., the modem's time will be shown as 4 p.m, since UTC is 8 hours "ahead" of Pacific time.

Configuring the PinPoint-E for GPS

To configure your modem's GPS settings, you can use either Wireless ACE or Tel-net to configure the modem using AT commands (page 64). The configuration examples in this chapter all use Wireless ACE. Most of the settings are in the menu option: **PinPoint**.

The main sections below detail how to set up the configuration for RAP (page 32), RAP special features (page 35), RAP Store and Forward (page 38), NMEA (page 42), and TAIP (page 44). Most of the PinPoint-E commands are covered in the main sections below.



Caution: With the PinPoint-E, all local GPS (UDP encapsulated) reports will come over the Ethernet connection. Raw GPS data can be transmitted across the serial port for applications which require COM traffic.

Over-The-Air (Remote) Host

To set the PinPoint-E to report to an external or remote host, configure *PPIP (ATS Server IP) and *PPPORT (Server Port). *PPIP will work an NMEA or TAIP remote host as well as with an ATS remote host.

FIGURE 1. Wireless ACE: *PPIP and *PPPORT

*PPIP	ATS Server IP	20.81.59.25	
*PPPORT	Server Port	22335	

Local Host

To set the PinPoint-E to report to an local host, one directly connected to the PinPoint-E's Ethernet port, configure S53. The local IP will automatically be used for local reports. S53, in Wireless ACE, is part of the **Misc** menu option.

FIGURE 2. Wireless ACE: S53

S53	Destination Port	0	1000
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If you need to send reports to additional local ports, you can specify other ports with *PPLATSEXTRA. Local Reports can be sent to up to 7 additional ports consecutively following the S53 port. Specify 0 to 7. If S53=1000 and *PPLATSEXTRA=4, reports will be sent to 1000, 1001, 1002, 1003, and 1004.

FIGURE 3. Wireless ACE: *PPLATSEXTRA

*PPLATSEXTRA	ATS Local Extra Report Ports	0	
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Report Types

There are several report types available. For remote reports, set *PPGPSR. For local reports, set *PPLATSR.

FIGURE 4. Wireless ACE: *PPGPSR and *PPLATSR

*PPGPSR	GPS Report Type (hex)	12	
*PPLATSR	ATS Local Report Type (hex)	12	

0 - *MF, Legacy reports for use with ATS version 4 and older. **11** - Global Positioning System (GPS) data.

12 - GPS data with the UTC time and date.

13 - GPS with time and date and Radio Frequency data from the antenna. **D0** - Xora reports.

E0 - NMEA GGA and VTG sentences.

E1 - NMEA GGA, RMC, and VTG sentences.

F0 - TAIP data

F1 - TAIPcompact data



Note: The PinPoint-E can be configured to supply one type of report to a remote host and different a report type locally through the Ethernet port at same time. However, there may be conflicts due to the local and remote reporting being in different modes and not all features to both modes may be available.

Sending Reports Automatically

You can configure the PinPoint-E to send reports based on a time interval and on the movement rate of a vehicle (based on it's position from one time to the next).

FIGURE 5. Wireless ACE: Automatic Reports

*PPTIME	Report Interval Time (Seconds)	600	
*PPDIST	Report Interval Distance (100 Meters)	48	
*PPTSV	Stationary Vehicle Timer (Minutes)	240	0
*PPMINTIME	PinPoint Minimum Report Time (secs)	0	

***PPTIME** - Location report sent every set time interval (seconds).

***PPDIST** - Location report sent only if the position is more than the set distance (x 100 meters).

***PPTSV** - Location report sent if the vehicle has been in one location (stationary) for more than a set time interval (minutes).

***PPMINTIME** - Location report sent be sent at no less than this time interval (seconds).

If you are sending reports on the local Ethernet port, if you want them sent automatically, you will need to set *PPLATS. The time interval, just as for *PPTIME, is in seconds.

FIGURE 6. Wireless ACE: Local Automatic Reports

*PPLATS	Local ATS Reporting Time Interval (secs)	0	
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The PinPoint-E can be configured to wait a specific amount of time after initialization before any reports are sent.

FIGURE 7. Wireless ACE: GPS Initialization Timer

#IG	GPS Init Timer (secs)	30	
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RAP Configuration

RAP is used with AirLink Tracking System and other applications. RAP has additional features which allow reports based on external physical events, input from a COM1000 device, store and forward processing, etc.

Most of the configuration settings for RAP can be changed with the RAP configuration command message. Refer to the AirLink Tracking System User Guide.

RAP Reports Over-The-Air (Remote)

To configure the PinPoint-E to send RAP reports to a remote server, you will need to set 3 commands: *PPIP, *PPPORT, and *PPGPSR.

FIGURE 8. Wireless ACE: RAP Reports Remote

*PPIP	ATS Server IP		10.0.0.2
*PPPORT	Server Port	22335	22335
*PPGPSR	GPS Report Type (hex)	12	12-GPS+Date

1. Set the IP (*PPIP) and port (*PPPORT) to the IP and port of the server to which you want the reports sent.
2. Set the GPS Report Type (*PPGPSR) to your preferred RAP report type.

11 - GPS - Global Positioning System data

12 - GPS + Date - GPS data with the UTC time and date

13 - GPS + Date + RF - GPS data with the UTC time and date and Radio Frequency information from the antenna.

If you need to use a dynamic IP for the ATS server, you can use the RAP configuration command to change the value for *PPIP (see below).



Note: If your PinPoint-E is on a mixed network (some of the fleet on another cellular network), you will need to specify the IP of the server in *PPIP and configure the PinPoint-E not to change the server IP with a RAP configuration command using *PPIGNOREIP. This will prevent the ATS server configuration packets from changing the *PPIP value.

FIGURE 9. Wireless ACE: *PPIGNOREIP

*PPIGNOREIP	Ignore RAP Server IP Update	0	<input type="text"/>
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RAP Reports over a Local Connection (PPP or SLIP)

Local reports are sent to the local IP address of the computer or device connected to the Ethernet port of the PinPoint-E using PPP or SLIP. To configure the modem to send to the local IP, you will need to set 3 commands: S53, *PPLATS, and *PPLATSR.

FIGURE 10. Wireless ACE: RAP Local Reports

S53	Destination Port	0	1000
*PPLATS	Local ATS Reporting Time Interval (secs)	0	5
*PPLATSR	ATS Local Report Type (hex)	12	13-GPS+Date+RF

1. Set the port (S53) to the local port to which you want the reports sent. The local IP will automatically be used. S53, in Wireless ACE, is part of the **Misc** menu option.
2. Set the ATS Local Report Type (*PPLATSR) to your preferred RAP report type.

- 11 - GPS** - Global Positioning System data
- 12 - GPS + Date** - GPS data with the UTC time and date
- 13 - GPS + Date + RF** - GPS data with the UTC time and date and Radio Frequency information from the antenna.
- 3. Set Local ATS Reporting Time Interval (*PPLATS) to the number of seconds you want as an interval between reports being sent. If *PPLATS is set to 0, reports will only be sent if a poll command is issued by the local client.

RAP Message format

RAP uses the UDP transport protocol to deliver messages between the Server and the PinPoint-E. The Server is the master and sends commands to one or more PinPoint-E devices. Each PinPoint-E returns command status and responses to the Server.

For reliability, the server expects each command to be acknowledged within a time-out period. If the acknowledgement packet (ACK) is not received within the time-out period, the server will retransmit the command.

The RAP messages are in Hex and are referred to by their message ID.

Commands

- 0x02** Request a location report from a PinPoint-E.
- 0x05** Request the PinPoint-E configuration.
- 0x06** Configure the PinPoint-E.
- 0x08** Set the PinPoint-E odometer.
- 0x09** Request the current PinPoint-E odometer setting.
- 0x11** Request a simple GPS report.
- 0x12** Request a simple GPS report with the date included (the time will be in UTC).
- 0x13** Request a simple GPS report with the date and radio frequency information included.

Power Reports

- 0x10** Power Up Report - Sent by the modem when it is powered up (either as a result of being power cycled or with a software reset).

0x30 Power Sleep Report - Sent by the modem when it is about to power down into a low-power state (not supported in some early PinPoint models).

0x31 Power Wakeup Report - Sent by the modem when it is returned to a full power state from a low-power state (not supported in some early PinPoint models)

GPS Reports

0x11 Simple GPS Report - Report contains GPS latitude and longitude in 1/100,000 degrees, GPS velocity in kilometers/hour, GPS Direction in 2 degree increments, UTC time (but not date), GPS satellite count and quality, and optional data

0x12 Simple GPS Report with the addition of the UTC date.

0x13 Simple GPS Report with the addition of the UTC date and including radio frequency data with the GPS point.

0x20-0x23 indicate the state changes of either the RTS or DTR (See “Store and Forward for RAP” on page 38) in addition to the same data as in an 0x12 report.

0x24-0x2B indicate the state changes of the COM1000 inputs (See “COM1000 Event Reports” on page 37) in addition to the same data in an 0x12 or 0x13 report.



Note: It is recommended to use Report type **0x12** or **0x13** when Store and Forward (page 38) is enabled.

Additional RAP Features

RAP allows additional information to be sent with or as the reports to enable a richer tracking feature set. Configure RAP as you would normally for remote or local reports (See “RAP Configuration” on page 32).

Device ID

By enabling *PPDEVID, the device ID is sent as part of the RAP message to make identification easier in a network or fleet of vehicles equipped with PinPoint-E modems.

FIGURE 11. Wireless ACE: *PPDEVID

*PPDEVID	Use Device ID in Location Reports	1	
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Caution: If the PinPoint-E is using a dynamic IP, *PPDEVID needs to be enabled.

Generally, the device ID the PinPoint-E will use is the IP or phone number assigned by Verizon.

Odometer Data in Reports

When the odometer is enabled, the PinPoint-E will calculate distance based on GPS data. The modem's odometer calculations can be included in the RAP message.

FIGURE 12. Wireless ACE: Odometer Reports

*PPDOM	Odometer Enable	0	
*PPDOMVAL	Odometer Value (meters)	0	



Note: The PinPoint-E's odometer calculations may not match the odometer in the vehicle itself. The PinPoint-E odometer is not connected to the vehicle's, it is entirely based on calculations of GPS readings.

Serial Input Event Reports

You can configure the PinPoint-E to send reports based on the state of the DTR and/or RTS pins on the serial port. Refer to "Capturing Events via External Inputs on" page 23 to set up the external devices.

Once the serial port has been connected, you will also need to enable the event reporting for GPS.

FIGURE 13. Wireless ACE: Enabling RTS and DTR for Input Events

RTSI	RTS Input Enable	0	<input type="button" value="v"/>
DTRI	DTR Input Enable	0	<input type="button" value="v"/>

If you have connected the physical device to the RTS pin and ground, you will need to enable RTSI. If you have connected it to the DTR pin and ground, you will need to enable DTRI. You can have different devices connected to each. If you have two connected, enable both.

To enable the reports themselves, use *PPINPUTEVT.

FIGURE 14. Wireless ACE: Input Event Reports

*PPINPUTEVT	Enable input event reports	0	1-Enable <input type="button" value="v"/>
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The report type will indicate the state of change in either RTS or DTR.

Input	Value	Report Type
DTR	0	0x20
DTR	1	0x21
RTS	0	0x22
RTS	1	0x23

The contents of the report will be the same as Report Type **0x12** (GPS data with date) with the addition of the event report (page 34).

COM1000 Event Reports

Support for the COM1000 is enable with the register *PPCOM1000=1 (0 = off [default], 1 = on). Once enabled, ALEOS will receive the UDP packets from a properly configured COM1000 and add the state of the extra inputs to RAP packets sent to ATS.

FIGURE 15. Wireless ACE: COM1000 Events

*PPCOM1000	Extra inputs for COM1000	0	
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The report type will indicate the state of change in the inputs.

Input	Value	Report Type
INPUT 1	LO	0x24
INPUT 1	HI	0x25
INPUT 2	LO	0x26
INPUT 2	HI	0x27
INPUT 3	LO	0x28
INPUT3	HI	0x29
INPUT 4	LO	0x2A
INPUT 4	HI	0x2B

The contents of the report will be the same as Report Type **0x12** (GPS data with date) or **0x13** (GPS data with date and RF data) with the addition of the event report.

Store and Forward for RAP

The Store and Forward (SnF) allows the PinPoint-E to store messages and send them to the server in a packet rather than individually.

FIGURE 16. Wireless ACE: Store and Forward

*PPSNF	SNF Enable	0	
*PPSNFB	SNF Mode	0	
*PPSNFM	SNF Minimum Reports	0	

Once you have enabled SnF, *PPSNF, you can determine how you want the messages sent using *PPSNFB, Store and Forward Mode:

Normal - Each report is sent immediately.

Polled - Reports held until requested by the server.

Grouped - Reports held until total is equal or greater than *PPSNFM which sets the packet size of grouped reports.

Store and Forward Reliable Mode

The Store and Forward Reliable Mode allows the PinPoint-E to ensure all messages are received by the server even if the connection between them goes down for a period of time (such when a vehicle passes through a location where the cellular signal is weak or non-existent).

FIGURE 17. Wireless ACE: Store and Forward Reliable Mode



With Reliable Mode enabled, *PPSNFR, the PinPoint-E will transmit a sequence number (1 to 127) as part of a packet of messages (may contain one or more reports). To reduce overhead, the server only acknowledges receipt of every eighth packet. The PinPoint-E considers that 8 a “window” of outstanding packets.

If the PinPoint-E doesn’t receive acknowledgement for a “window”, the modem will PING the server with a message containing the sequence numbers of the first and last packets that haven’t been acknowledged. The PinPoint-E will continue until the server acknowledges receipt. When the PinPoint-E receives the acknowledgement, it will advance its “window” to the next group.

When the PinPoint-E is first powered on (or reset), it will send a Set Window message to sync up with the server for the current “window”.

On the other side, if the server receives an out of sequence packet, it will send a message to the modem noting the missing sequence and the PinPoint-E will retransmit.

GPS Time, Latitude, and Longitude can be added, *UDPRGPS, to the packet sequence data for Reliable Mode.

FIGURE 18. Wireless ACE: Adding GPS Time, Latitude, and Longitude to Reliable UDP data

*UDPRGPS	Add GPS Time and Lat/Long	0	
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Sending Reports

You can configure the PinPoint-E to send reports based on a time interval and on the movement rate of a vehicle (based on it's position from one time to the next).

FIGURE 19. Wireless ACE: Automatic Reports

*PPTIME	Report Interval Time (Seconds)	600	
*PPDIST	Report Interval Distance (100 Meters)	48	
*PPTSV	Stationary Vehicle Timer (Minutes)	240	0
*PPMINTIME	PinPoint Minimum Report Time (secs)	0	

***PPTIME** - Location report sent every set time interval (seconds).

***PPDIST** - Location report sent only if the position is more than the set distance (x 100 meters)

***PPTSV** - Location report sent if the vehicle has been in one location (stationary) for more than a set time interval (minutes).

***PPMINTIME** - Location report sent be sent at no less than this time interval (seconds).

Flush on Event

If you have events enabled, with *PPFLUSHONEVT, you can configure the PinPoint-E to flush the SnF buffer when an event occurs. This will drop all outstanding packets and not transmit or retransmit them.

FIGURE 20. Wireless ACE: Store and Forward Flush on Event

*PPFLUSHONEVT	Flush SnF Buffer on input	0	
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Note: Outstanding packets can include messages already sent to the server that haven't been acknowledged (SnF Reliable Mode) whether they have been received by the server or not.

Legacy ATS/RAP

If your ATS server is running ATS version 4 or older, then you will need to configure the PinPoint-E to send an earlier version of RAP. If you want to send the legacy message to a remote server, you will need to configure *PPGPSR to *MF. If you want to send the legacy messages locally (over the Ethernet port) you will need to configure *PPLATSR to *MF. IP and port configuration is as above for other RAP configurations.

FIGURE 21. Wireless ACE: *PPGPSR and *PPLATSR

*PPGPSR	GPS Report Type (hex)	12	<input type="text"/>
*PPLATSR	ATS Local Report Type (hex)	12	<input type="text"/>

You will also need to specify the type of Legacy format, *MF, you are using. The format is specified in hex.

FIGURE 22. Wireless ACE: Legacy format

*MF	Legacy Format	8F	<input type="text"/>
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8A - Transmit Latitude, Longitude, and Time

8E - Transmit Latitude, Longitude, Direction, Velocity and Time

8F - Transmit Latitude, Longitude, Direction, Velocity, Time, and GPS satellite quality

NMEA Configuration

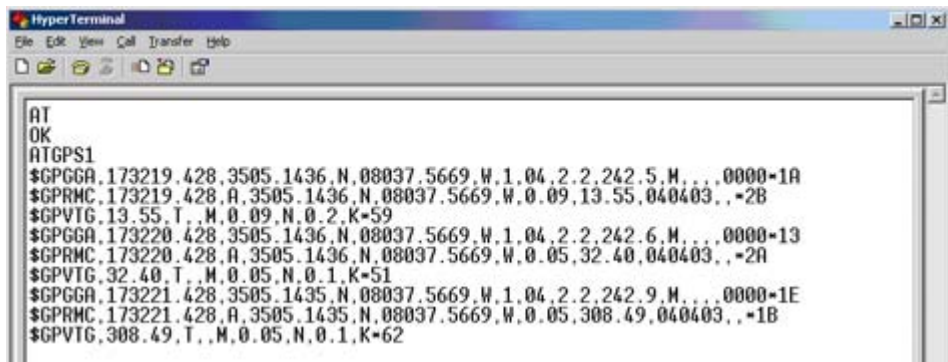
The PinPoint-E transmits standard NMEA GPS messages as well as the proprietary RAP format.

Streaming NMEA Messages over the local port

The PinPoint-E can be configured to send standard NMEA messages (sentences) in ASCII over the Ethernet port from the local computer. For examples of the message format descriptions, refer to page 110.

Send the command **ATGPS1** to the Ethernet port to begin the NMEA stream. The example below shows the stream in HyperTerminal connecting directly to a Pin-Point via the comport.

FIGURE 23. HyperTerminal: NMEA Stream



```
AT
OK
ATGPS1
$GPGGA,173219.428,3505.1436,N,08037.5669,W,1.04,2.2,242.5,M,...,0000-1A
$GPRMC,173219.428,A,3505.1436,N,08037.5669,W,0.09,13.55,040403,...,2B
$GPVTG,13.55,T,M,0.09,N,0.2,K-59
$GPGGA,173220.428,3505.1436,N,08037.5669,W,1.04,2.2,242.6,M,...,0000-13
$GPRMC,173220.428,A,3505.1436,N,08037.5669,W,0.05,32.40,040403,...,2A
$GPVTG,32.40,T,M,0.05,N,0.1,K-51
$GPGGA,173221.428,3505.1435,N,08037.5669,W,1.04,2.2,242.9,M,...,0000-1E
$GPRMC,173221.428,A,3505.1435,N,08037.5669,W,0.05,308.49,040403,...,1B
$GPVTG,308.49,T,M,0.05,N,0.1,K-62
```

To stop the stream, use the command **ATGPS0** (this can be entered even while data is streaming). You can also use **AT*PGPS=1** then **AT&W** to allow you to stream the data even after the modem is reset.

You can also issue this command using Wireless ACE to stream the data from the Ethernet port without using HyperTerminal or another terminal application. The data will stream even after the modem is reset.

FIGURE 24. Wireless ACE: NMEA Strings

*PGPS	Persistent GPS NMEA Strings	0	
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NMEA Messages Over-The-Air (Remote)

To configure the PinPoint-E to send NMEA reports to a remote server, you will need to set 3 commands: *PPIP, *PPPORT, and *PPGPSR.

FIGURE 25. Wireless ACE: NMEA Remote Reports

*PPIP	ATS Server IP		10.0.0.2
*PPPORT	Server Port	22335	1000
*PPGPSR	GPS Report Type (hex)	12	E0-NMEA GGA+VTG

1. Set the IP (*PPIP) and port (*PPPORT) to the IP and port of the server to which you want the reports sent.
2. Set the GPS Report Type (*PPGPSR) to your preferred NMEA sentence format.
E0 - Output the GGA and VTG sentences.
E1 - Output the GGA, RMC, and VTG sentences.

NMEA Messages over a Local Connection

Local reports are sent to the local IP address of the computer or device connected to the Ethernet port of the PinPoint-E. To configure the modem to send to the local IP, you will need to set 3 commands: *S53, *PPLATS, and *PPLATSR.

FIGURE 26. Wireless ACE: NMEA Local Reports

S53	Destination Port	0	1000
*PPLATS	Local ATS Reporting Time Interval (secs)	0	5
*PPLATSR	ATS Local Report Type (hex)	12	E1-NMEA GGA+VTG+RMC

1. Set the port (S53) to the local port to which you want the reports sent. The local IP will automatically be used. S53, in Wireless ACE, is part of the **Misc** menu option.
2. Set the ATS Local Report Type (*PPLATSR) to your preferred NMEA sentence format.
E0 - Output the GGA and VTG sentences.
E1 - Output the GGA, RMC, and VTG sentences.
3. Set Local ATS Reporting Time Interval (*PPLATS) to the number of seconds you want as an interval between reports being sent.

TAIP Emulation Configuration

The TAIP emulation functionality allows the PinPoint-E to operate in a limited manner with clients which only understand the Trimble ASCII Interface Protocol (TAIP). This emulation is enabled by setting the GPS report format, directing the modem to listen for TAIP messages, and disabling AirLink Binary/ATS formatted messages. For the message format descriptions, refer to page 113.

TAIP Messages Over-the-Air (Remote)

To configure the PinPoint-E to send TAIP reports to a remote server, you will need to set 3 commands: *PPIP, *PPPORT, and *PPGPSR.

FIGURE 27. Wireless ACE: TAIP Remote Reports

*PPIP	ATS Server IP		10.0.0.2
*PPPORT	Server Port	22335	
*PPGPSR	GPS Report Type (hex)	12	F0-TAIP_data

1. Set the IP (*PPIP) and port (*PPPORT) to the IP and port of the TAIP server.
2. Set GPS Report Type (*PPGPSR) to **F0-TAIP** data.



Note: Unlike standard TAIP which simply sends to the last client to request automatic reports, the remote reports are sent to the destination address (*PPIP) and destination port (*PPPORT).

TAIP Messages over a Local Connection

Some TAIP client applications can send TAIP requests and listen for reports using a local connection. Generally this is done over the Ethernet port. To configure this option, you will need to set four commands: *PPIP, S53, *PPGPSR, and *PPLATS.

FIGURE 28. Wireless ACE: TAIP Local Reports

*PPIP	ATS Server IP	20.81.59.25	
S53	Destination Port	0	1000
*PPGPSR	GPS Report Type (hex)	12	F0-TAIP data
*PPLATS	Local ATS Reporting Time Interval (secs)	0	0

1. Set the IP (*PPIP) to the local IP of the PinPoint-E.
2. Set the port (S53) to **21000**. The local IP will automatically be used. S53, in Wireless ACE, is part of the **Misc** menu option.
3. Set GPS Report Type (*PPGPSR) to **F0 - TAIP Data**.
4. Set the Local ATS Reporting Time Interval (*PPLATS) to **0** to disable unsolicited local reports.

With this configuration, the PinPoint-E will listen for TAIP requests on the local IP (192.168.13.31 by default) and port 21000. Once a TAIP request command has been received, the PinPoint-E will begin issuing TAIP reports (e.g. DPVs) to the local IP and port 21000. The client application should be listening for reports on this IP address and port.

No unsolicited reports will be sent from the PinPoint-E to the local client application.

Sending Unsolicited TAIP Messages over a Local Connection

Standard TAIP requires a request before GPS reports are sent. The PinPoint-E, however, can be configured to allow TAIP formatted messages to be sent over any UDP Port without request commands. This is useful for those applications which can listen for TAIP messages but cannot send UDP request packets.

This configuration sends TAIP GPS reports to whatever address and UDP Port you select. You will need to set 3 commands: S53, *PPLATS, and *PPLATSR.

FIGURE 29. Wireless ACE: TAIP Local Reports, Unsolicited

S53	Destination Port	0	1000
*PPLATS	Local ATS Reporting Time Interval (secs)	0	5
*PPLATSR	ATS Local Report Type (hex)	12	F0-TAIP data

1. Set the port (S53) to **1000**. The local IP will automatically be used. S53, in Wireless ACE, is part of the **Misc** menu option.
2. Set ATS Local Report Type (*PPLATSR) to **F0 - TAIP Data**.
3. Set the Local ATS Reporting Time Interval (*PPLATS) to **5** to send reports every 5 seconds (can be adjusted as circumstances warrant).

Using TAIP Command Emulation

To configure the PinPoint-E to use TAIP emulation set GPS Report Type (*PPGSPR) to **F0 - TAIP Data**.

FIGURE 30. Wireless ACE: TAIP Emulation

*PPGSPR	GPS Report Type (hex)	12	F0-TAIP data
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Note: With TAIP emulation, the PinPoint-E will listen for TAIP messages on port 21000. AirLink Protocol (RAP) will be disabled and no RAP messages or commands will be sent or received on that port.

TAIP ID

The TAIP messages can be configured to send the user specified identification number (ID). This greatly enhances the functional capability of the unit in a network environment. Set the ID using *PPTAIPID.

FIGURE 31. Wireless ACE: TAIP ID



Supported TAIP Commands

The TAIP emulation will accept the following TAIP message types:

SRM allows the client to set the reporting mode configuration. The report mode configuration is not stored in non-volatile memory and such should be reset upon a unit reset. This behavior emulates that specified in TAIP specifications.

QRM reports the reporting mode configuration (returns an "RRM" message).

SID allows the client to set the TAIP ID (AT*PPTAIPID can also be used to set the TAIP ID). The TAIP ID, when set with a "SID" message, will be written to non-volatile memory.

QID reports the TAIP ID (returns an "RID" message).

DPV configures automatic reporting of PV (Position/Velocity) reports based on distance traveled and a maximum time. The delta distance value specified in the message is converted to hundreds of meters and stored as *PPDIST. The maximum time interval is stored as *PPTIME. Currently the minimum time and epoch values are ignored.

FPV configures periodic reporting of PV (Position/Velocity) reports. The time interval from the message is stored at *PPTIME. Currently the epoch value is ignored.

QPV responds with a PV (Position/Velocity) report.

The TAIP emulation will generate the following reports corresponding to the appropriate event (either a query for it, echoed due to a set, or due to an automatic reporting event).

RRM reports the reporting mode configuration.

RID reports the TAIP ID.

RPV reports Position/Velocity.

Simple Network Management Protocol (SNMP)

The PinPoint-E can be configured as an SNMP agent and supports SNMPv2c and SNMPv3.

SNMP Overview

The Simple Network Management Protocol (SNMP) was designed to allow remote management and monitoring of a variety of devices from a central location. The SNMP management system is generally composed of agents (such as your PinPoint-E, a router, a UPS, a web server, a file server, or other computer equipment) and a Network Management Station (NMS) which monitors all the agents on a specific network. Using the management information base (MIB), an NMS can include reporting, network topology mapping, tools to allow traffic monitoring and trend analysis, and device monitoring.

Authentication ensures SNMP messages coming from the agent, such as the PinPoint-E, have not been modified and the agent may not be queried by unauthorized users. SNMPv3 uses a User-Based Security Model (USM) to authenticate and, if desired or supported, message encryption. USM uses a user name and password specific to each device.

Management Information Base (MIB)

The management information base (MIB) is a type of database used to compile the information from the various SNMP agents. Reports from various agents, such as the PinPoint-E, are sent as data in form designed to be parsed by the NMS into its MIB. The data is hierarchical with entries addressed through object identifiers.

SNMP Traps

The trap is a “snap-shot” of the settings and status of the Agent’s device which is sent as a report to the NMS in a form that can be parsed and stored in the MIB. For an example of the trap from an AirLink modem refer to the Appendix, page 100.

PinPoint-E SNMP Configuration

To configure your PinPoint-E to work as an SNMP agent, you can use either Wireless ACE, direct serial communication or Telnet to configure the modem using AT commands (page 53). In Wireless ACE, the SNMP commands are all on the **Other** menu option.

There are only three commands to set for SNMP in the PinPoint-E: the listening port, the security level, and the trap destination.

Listening Port

*SNMPPORT sets the port for the SNMP agent to listen on. If set to zero, default, SNMP is disabled.

FIGURE 1. Wireless ACE: *SNMPPORT



The screenshot shows a configuration window with a light blue border. It contains two main input fields. The first field is labeled '*SNMPPORT' and has a value of '0' entered. The second field is labeled 'SNMP Port' and is currently empty.

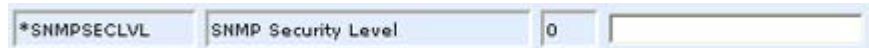


Note: SNMP generally uses port 161, however most Internet providers (including cellular) block all ports below 1024 as a security measure. You should be able to use a higher numbered port such as 10161.

Security Level

*SNMPSECLVL sets the security level and which version of SNMP communications are used.

FIGURE 2. Wireless ACE: *SNMPSECLVL

A screenshot of a configuration window for 'Wireless ACE'. It features a label '*SNMPSECLVL' followed by a text box containing 'SNMP Security Level'. To the right of the text box is a numeric input field with the value '0' displayed. Further right is an empty rectangular box.

0 - No security required. SNMPv2c and SMNPv3 communications are allowed.

1 - Authentication required. SNMPv3 is required to do authentication and SNMPv2c transmissions will be silently discarded. Authentication is equivalent to the authNoPriv setting in SNMPv3.

2 - Authentication required and messages are encrypted. SNMPv3 is required to do authentication. SNMPv2c and SNMPv3 authNoPriv transmissions will be silently discarded. Authentication and encryption is equivalent to the authPriv setting in SNMPv3.

User Name and Password

The user name is '*user*'. The user name cannot be changed.

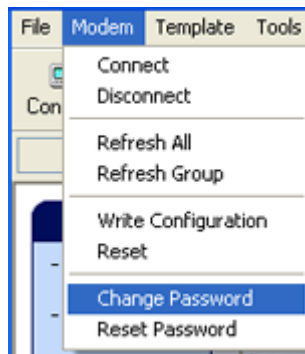
The PinPoint-E's password is used as the SNMP password (default is '*12345*').



Note: The eight-character password requirement for SMNPv3 is not enforced by the PinPoint-E's Agent to allow the default password to function. Your SNMP administrator or MIS may require you to change to a more secure and/or longer password.

To change the password in the PinPoint-E, select **Modem** from the top menu line in Wireless ACE.

FIGURE 3. Wireless ACE: Changing the PinPoint-E Password - Menu Option



The current password will be pre-entered. As you type the new password and confirm it, the characters you type will be obscured by “x”.

FIGURE 4. Wireless ACE: Changing the PinPoint-E Password



For the password, you can use numbers, letters, and/or punctuation.



Caution: The password is case sensitive. “drowssaP” is not the same as “drowssap”.

Trap Destination

*SNMPTRAPDEST needs to be set with the destination IP and port. If either are set to zero or empty, SNMP traps are disabled.

FIGURE 5. Wireless ACE: *SNMPPORT

*SNMPTRAPDEST	SNMP Trap Destination IP	/0	<input type="text"/>
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Note: Traps are sent out according to the SNMP security level (i.e. if the security level is 2, traps will be authenticated and encrypted). Currently, the only trap supported is *LinkUp*.

The PinPoint-E plays the part of a host when its Ethernet port is connected to a computer or another device. As the host, the PinPoint-E can be in one of two communication modes.

AT: The PinPoint-E accepts and responds to standard, Hayes-style AT commands.

PassThru: Direct connection to internal hardware (OEM Module) of the PinPoint-E.

By default, the PinPoint-E is in AT Mode and allows AT Commands to be entered via Telnet (through the Ethernet port connection) or remotely (through the cellular network).

PassThru Mode can only be exited by resetting the modem.

AT Mode

AT commands are used to configure the modem, command it to do something, or query a setting. For a full listing of the AT commands, refer to page 64.

AT commands must always be terminated by <CR> (ASCII character 0x0D).

If **E=1** (Echo On), the AT command (including the terminating <CR>) will be displayed (output) before any responses.

Two settings affect the format of AT command output: V (Verbose) and Q (Quiet).

If **Q=1** (Quiet On), no result codes are output whatsoever, so there is no response generated by a (non query) command.

If **Q=0** (Quiet Off), result codes are output. The format of this output is then affected by the Verbose setting.

If Quiet mode is off, the result code is affected as follows:

For **V=1** (Verbose mode), the textual result code is surrounded by <CR><LF> and any AT query response is also surrounded by <CR><LF>.

For **V=0** (Terse mode), a numeric result code is output with a single trailing <CR> (no <LF> is output), while any AT query response is followed by <CR><LF> (there is no preceding output).

For example, possible output to the AT command "AT<CR>" (assuming quiet mode is not on) is:

<CR> - if V=0

<CR><LF>OK<CR><LF> - if V=1

PassThru Mode

In PassThru mode, the PinPoint-E does not behave normally, all Ethernet port communication is passed directly between the internal hardware and the computer connected directly to the modem. This mode can be used to configure hardware-specific settings (e.g., for provisioning, etc.).

Issuing the "**AT\APASSTHRU**" enters this mode. The modem responds with **OK**, at which point a direct connection to the internal hardware is established.

Some internal hardware requires upwards of 20 seconds before AT commands can be entered, so be patient if there seems to be no response to AT commands.



Caution: PassThru can only be exited by resetting or power-cycling the modem. This mode cannot be entered via a Telnet session.

PassThru Mode allows only specific AT commands. Those commands which are used with ALEOS only will be unavailable. The commands usable also depend heavily on the modem model number (found on the label on the top of the modem).



Caution: ALEOS is disabled in PassThru Mode. You cannot use most ALEOS specific commands while the modem is in PassThru Mode.

Your AirLink PinPoint-E should be mounted in a position that allows easy access for the cables so they are not bent or constricted. The LEDs on the front panel should be visible for ease of operational verification. You should ensure that there is adequate airflow around the modem but that it is kept free from direct exposure to the elements (sun, rain, etc.). The exterior of the case should also be grounded.

Possible locations for your PinPoint-E installed in a vehicle are in a trunk away from where luggage or other items won't be likely to dislodge it, under or in the console, or behind seats. Ensure the location is secure both against abrupt movements of the vehicle and from other items coming into contact with the modem.

An optional accessory for your modem is a mounting kit. The bracket is designed to snugly cradle the modem and hold it in place where you need it. See "Mounting Kit" on page 62.

Connecting the Antennas

Your PinPoint-E will work with most standard cellular antennas with a connector and rated to work with EV-DO technology. Connect the primary antenna or primary RF cable directly to the connector on the back of the PinPoint-E.

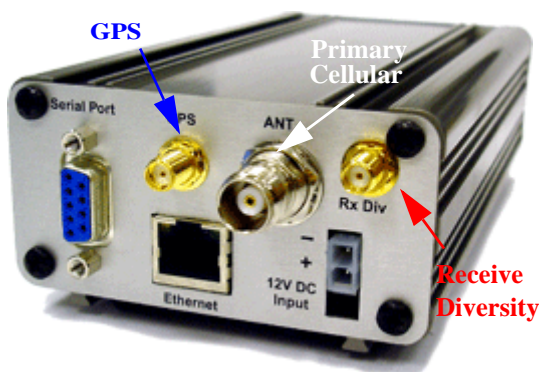
To provide for diversity in the signal reception and broadcast, connect the second cable or magnetic mount base directly to the second antenna port (SMA, marked Rx Div) on the back of the PinPoint-E.



Use of receive diversity is optional. Data transmission and reception will not be adversely affected if it is not used.

Your PinPoint-E will work with most standard active GPS antennas. Connect the antenna or cable directly to the threaded connector.

FIGURE 1. PinPoint-E connectors



Connecting power

Your PinPoint-E can be used with either DC (available in most automobiles) or 110 AC (standard US wall power) with the appropriate power adapter (available from AirLink).

The power cable positive lead should be connected to the battery or power source positive terminal. The power cable negative lead should be connected to the battery or power source negative terminal. The PinPoint-E has an internal polysilicon circuit breaker that opens at 0.5 to 1.0 amps of current.

Connecting the PinPoint-E to a computer or other device

Your PinPoint-E's serial port can be connected directly to most computers or other devices using a standard straight through cable. If you have a DCE device, you will need a null modem or null modem cable.

The PinPoint-E's Ethernet port can be connected directly to a computer or other Ethernet device using a cross-over cable. If you are connecting the modem to a hub or switch you should use a straight through cable or use the uplink port on the hub or switch with a cross-over cable. Some newer computers have an auto-sensing Ethernet port. You can use a straight through cable with computers so equipped.

Your PinPoint-E can also be connected to a USB to Ethernet device connected to a computer or other device which does not have an available Ethernet port but does have USB.



On some computers, the TCP receive window may be set to 16 kbytes. To optimize the throughput of your PinPoint-E, it is recommended that you change the TCP window to 128 kbytes to 256 kbytes using a TCP Optimizer.

You can obtain a TCP Optimizer, with instructions on how to change the setting, from your local computer retailer or as a download from the Internet using Google or another search engine (search for "TCP Optimizer"). One TCP Optimizer which AirLink has used successfully is from <http://www.speedguide.net>.

Specifications for the PinPoint-E EV-DO

Physical Characteristics:

- Weight: 2 lb.
- Size: 6.8" x 3.3" x 2"
- RF Antenna Connector: 50 Ohm TNC
- Receive Diversity RF Antenna Connector: 50 Ohm SMA
- GPS Antenna Connector: SMA
- Ethernet Interface: RJ-45 Connector, 10 Base-T
- Serial Interface: RS232 DB-9 with 1200-115200 bps
- Status LEDs

Data Services & RF Features: EV-DO

- Full duplex transceiver
- Dual-band support for both 800 MHz cellular and 1.9 GHz PCS bands
- Dual band Receive Diversity
- CDMA 1xEV-DO (IS-856)

Environmental:

- Operating ranges: -30°C to +70°C
- Humidity: 5%-95% Non-condensing

Power Management:

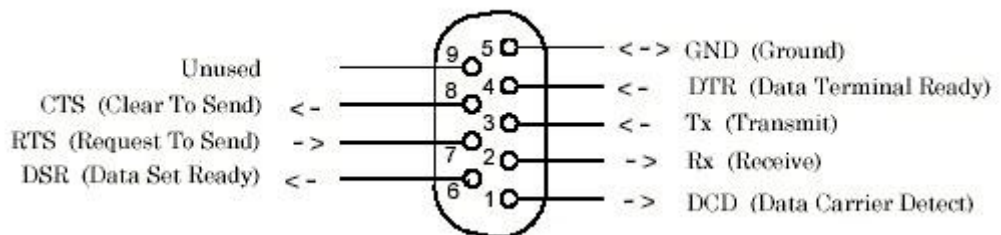
- Low power consumption
- Dormant connection (idle for 10-20 seconds): 60 mA at 12 VDC
- Input Voltage: 10 VDC to 28 VDC
- Input Current: 20 mA to 350 mA
- Low power mode: at 12 VDC

Power consumption

Modem	Idle	Transmitting
PinPoint-E	180 mAh	300 mAh

Serial Port Pin-outs

The cable between the modem and a computer or other serial device needs to be wired straight-through (pin 1 goes to pin 1, pin 2 to pin 2, etc).



Mounting Kit

An optional accessory for your modem is a mounting kit. The bracket is designed to snugly cradle the modem and hold it in place where you need it.

The PinPoint-E “snaps” into place in the bracket locking into the grooves on the PinPoint-E case. The bracket can be further secured with a twist-tie set into the grooves on the top for situations where the modem may be subjected to violent movement, such as in the back of an automobile. In most stationary installations, such as in a field or pipe, the PinPoint-E and bracket shouldn’t require a twist-tie.

The bracket can be attached to the location using #6 screws (mounting hole diameter approximately 0.150”).

FIGURE 1. PinPoint-E Mounting Bracket, part number 100-170-1005

AT Commands

Just as with a Hayes compatible analog modem, the PinPoint-E parameters can all be configured with AT commands.



Using Wireless Ace

Wireless ACE is a graphical interface for the AT commands and it is highly recommended that you use this utility to modify any parameters, however a terminal emulation application, such as Telnet, see below, can be used instead.

With Wireless ACE, you only need to find the command listed and then enter the new value in the space provided. For those commands which have specific parameters, the choices will be in a drop down menu.



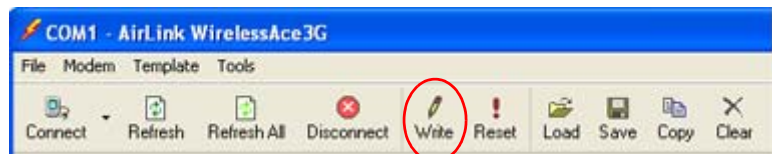
Note: Nearly all examples of entering commands in this User Guide are using Wireless ACE.

FIGURE 1. Wireless ACE: Using AT Commands

AT	Name	Value	New Value
*HOSTPRIVMODE	Use Private IP	0	<input type="text"/>
*HOSTPRIVIP	Host Private IP	0.0.0.0	<input type="text"/>

To set or commit the changes in the modem, use the **Write** button at the top of Wireless ACE interface.

FIGURE 2. Wireless ACE: Toolbar



For more information on using Wireless ACE 3G or Wireless ACE Web, please refer to the **Wireless ACE 3G User Guide**.



Note: Some of the AT Commands are not able to be configured in Wireless ACE 3G.



With Wireless ACE, you can create a template from one modem and then use that template to configure other modems in the exact same way. You can use a in AceNet, too, to configure several modems the same all at once.



Using Telnet Terminal Emulation

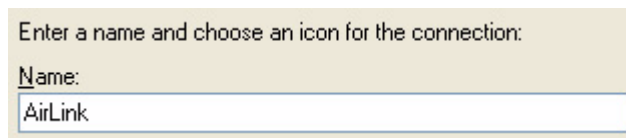
It is possible to communicate with the PinPoint-E across a TCP/IP network. Telnet provides a terminal style connection to the PinPoint-E.

Most installations of Microsoft Windows come with a version of HyperTerminal (used here for specific directions), but you can use any other Telnet application, such as Putty.

Start>All Programs>Accessories>Communications>HyperTerminal

1. Choose a name for your connection, such as **PinPoint-E** or **AirLink**. The name and icon are only for your own reference so you can find the connection at a later date (if you want to have a connection saved for both local and remote, it is recommended the connection name reflect the connection type, i.e. PinPoint-E Remote).

FIGURE 3. HyperTerminal: Connection Name



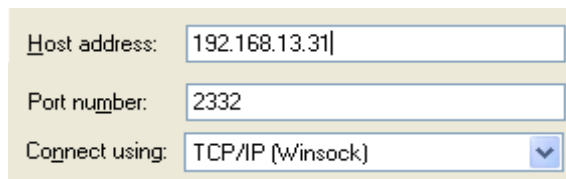
Enter a name and choose an icon for the connection:

Name:

AirLink

2. Select TCP/IP (Winsock) for **Connect Using**. Then, if the modem is connected directly to your computer's Ethernet port, put in the **host address** of **192.168.13.31** or the *HOSTIP. If the modem is remote, the **host address** will be the current Internet IP of the PinPoint-E. Change the **port number** to **2332** (default telnet port for the PinPoint-E).

FIGURE 4. HyperTerminal: TCP/IP Settings



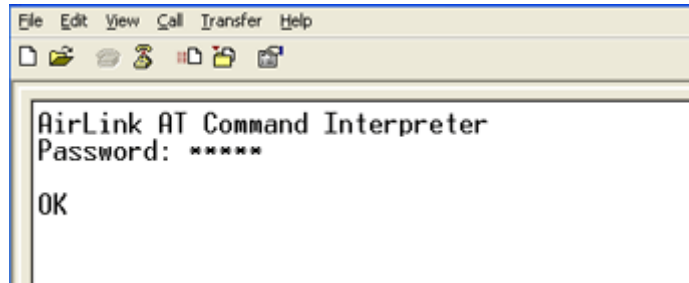
Host address: 192.168.13.31

Port number: 2332

Connect using: TCP/IP (Winsock) ▼

3. When HyperTerminal connects to the PinPoint-E, you may be prompted for a password. The default password is **12345**. When you press **Enter**, you should get back a reply of "OK".

FIGURE 5. HyperTerminal: AT mode via Telnet



4. Type **AT** and press *Enter*. You should get a reply of “OK” or “0”.
5. To see what you are typing as you type it, you will need to turn on the echo and verbose mode. Type **ATE1V1** and press *Enter*.

If you get a reply of “OK”, then you entered the command successfully. If you get a reply of “0” or “ERROR”, try entering the command again.



Direct Serial Connection

Using HyperTerminal included with most installations of Microsoft Windows:

Start>All Programs>Accessories>Communications>HyperTerminal

1. Choose a name for your connection, such as **PinPoint-E** or **AirLink** (if you want to have a connection saved for both local and remote, it is recommended the connection name reflect the connection type, i.e. PinPoint-E local). The name and icon are only for your own reference so you can find the connection at a later date.

FIGURE 6. HyperTerminal: Connection Name

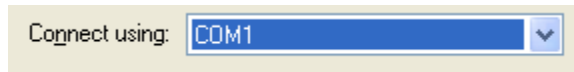
Enter a name and choose an icon for the connection:

Name:

AirLink

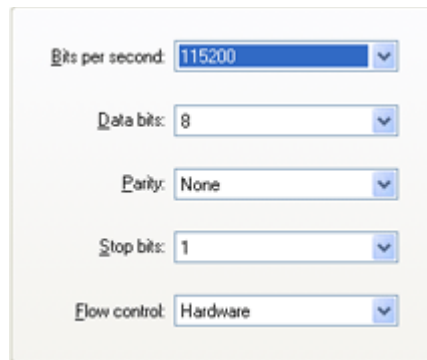
2. Select COM1 for the **Connect Using**.

FIGURE 7. HyperTerminal: Comport Setting



3. Change the **Bits per Second** to 115200 (default), **Data Bits** to 8, **Parity** to None, **Stop Bits** to 1, and **Flow Control** to Hardware.

FIGURE 8. HyperTerminal: Comport Settings



4. Type **AT** and press **Enter**. You should get a reply of “OK” or “0”. .
5. To see what you are typing as you type it, you will need to turn on the echo and verbose mode. Type **ATE1V1** and press **Enter**.
6. If you get a reply of “OK”, then you entered the command successfully. If you get a reply of “0” or “ERROR”, try entering the command again.

AT Command Tables

The tables below list the AT commands, their parameters, and explain what they do.

- For most commands, you need to preface the command with **AT** (exceptions are noted), i.e. **ATA** which listed as **A**

-
- Some commands have specific parameters while other commands will take whatever your type.
 - Acceptable parameters and/or specific formats are in the parameters column.
 - Required variable parameters are denoted with italicized text, ex. *Dn*. The *n* is variable and noted in the parameters column.
 - Optional parameters are denoted with square brackets [].
 - Most commands with parameters can be entered with ? to read the current value (for example, **AT&D?** will respond with “2” if the default has not been changed).
 - AT Commands are not case sensitive. A capital “E” is the same as a lower-case “e”.
 - If you enter a command which is recognized by the PinPoint-E, it will respond with “OK”. If the command is not recognized, the response will be “ERROR”.
 - Those commands applicable only to certain model numbers of the PinPoint-E will be noted in the command column.



Caution: Symbols listed with commands, such as *, /, &, or ?, are part of the command and must be included. Commands with symbols other than * may require PassThru mode.



Note: Some commands may be presented on more than one table.

Information Commands

Most of the Commands in the “Information and Status” table, only, do not have any parameters. They only provide information. These commands are repeated elsewhere in their respective categories as well.

TABLE 1. Information and Status

Command	Details
I[n]	<p><i>n</i>=0 Product name (for example, PinPoint-E).1 The PinPoint-E's firmware (ALEOS) version, hardware ID, and copyright. 2 The internal hardware's firmware version and relevant hardware ID.</p> <p><i>n</i>=3 The hardware module's unique ID (ESN).</p> <p><i>n</i>=5 View active profile (the contents of the active registers).</p>
&V	View active profile (the contents of the active registers).
*HOSTMODE?	The current host mode (AT, PPP, UDP, etc.). If the PinPoint-E is not in AT mode, telnet into the modem to execute this command.
*NETCHAN?	The current active EV-DO channel number.
*NETERR?	The EVDO or CDMA network frame error rate.
*NETIP?	<p>The current IP address of the modem reported by the embedded OEM module (generally obtained from Carrier). This is the address to which packets can be sent in order to contact the PinPoint-E from the Internet. Note: If there is no current network IP, 0.0.0.0 may be displayed.</p> <p>Use *NETALLOWZEROIP if you need to allow the display of an IP ending in a zero .</p>
*NETOK	<p>Checks the EV-DO network connection.</p> <p>OK if connected.</p> <p>ERROR if not connected.</p>
*NETPHONE?	The modem's phone number (if applicable or obtainable).
*NETRSSI?	<p>The current RSSI (Receive Signal Strength Indicator) of the PinPoint-E as a negative dBm value.</p> <p>The same information is displayed with the command S202?.</p>

TABLE 1. Information and Status

Command	Details
*NETSTATE?	<p>The current network state:</p> <p>Connecting To Network = The PinPoint-E is in the process of trying to connect to the EV-DO network.</p> <p>Network Authentication Fail = Authentication to the EV-DO network has failed. Verify settings to activate the PinPoint-E.</p> <p>Network Negotiation Fail = Network connection negotiation failed. This is usually temporary and often clears up during a subsequent attempt.</p> <p>Network Ready = PinPoint-E is connected to the EV-DO network and ready to send data.</p> <p>Network Dormant = PinPoint-E is connected to the EV-DO network, but the link is dormant. It will be woken up when data is sent or received.</p> <p>No Service = There is no EV-DO network detected.</p> <p>Hardware Reset = The hardware module is being reset. This is a temporary state.</p>
*POWERMODE?	<p>Displays the current power state/mode. Possible values returned are:</p> <p>Initial - The modem is in the initial 5 minutes since power up, so power down event will be ignored.</p> <p>On - Regular power on, i.e. a power down is not pending.</p> <p>Low Cancellable - Power down is pending but still cancellable if the power down trigger goes away.</p> <p>Low Pending 1 and 2 - Power down is pending, any modem tasks are gracefully preparing for the power down.</p> <p>Low Final - Power down is imminent.</p> <p>Low - Power is down.</p>
*SMTPSTATUS?	<p>The status of the last issued SMTP message (*SMTPSEND). If no status is available 0 is returned. Once read, the status is cleared.</p> <p>The status codes are received from the SMTP server the modem attempted to send the request. Example: 354 = send in progress, 250 = sent ok.</p>

TABLE 1. Information and Status

Command	Details
*SNTPQUERY?	The current SNTP (Simple Network Time Protocol) time and date.

For most of the commands in the rest of the tables, you can query the current status of the associated register by substituting a “?” for any parameters, omitting the “=” if there is one, i.e. for the command *DPORT=*n*, you would enter **AT*DPORT?**.

Basic Commands

These commands are common to most communication devices using AT Commands.

TABLE 2. Basic Commands (common AT commands)

Command	Parameters	Details
+++ The "+" is ASCII 0x2B.	<i>none</i>	AT Escape sequence. Not proceeded by AT. If the PinPoint-E is in a data mode (any mode other than PassThru), this command causes the modem to re-enter AT command mode. There must be an idle time (set by S50) on the serial port before and after this command. The detection of +++ is disabled if DAE=1.
A/	<i>none</i>	Re-execute last command. Not proceeded by AT.
A	<i>none</i>	Answer - manual
DAE= <i>n</i>	<i>n</i> =0 or 1	Disable AT Escape Sequence detection. 0 : Enable +++ AT escape sequence detection. 1 : Disable +++ AT escape sequence detection.
En	<i>n</i> =0 or 1	Toggle AT command echo mode. 0 : Echo Off 1 : Echo On

TABLE 2. Basic Commands (common AT commands)

Command	Parameters	Details
H <i>n</i>	<i>n</i> =1	Hang-Up Command. 1 : Hang-up Note: With an AT telnet connection, this command will terminate the host data mode and return the PinPoint-E to an AT mode.
O	<i>none</i>	Online (Remote): Causes the PinPoint-E to go from Command State to data state.
Q <i>n</i>	<i>n</i> =0 or 1	The AT quiet-mode setting. If quiet mode is set, there will be no responses to AT commands except for data queried. 0 : Off (Default) 1 : Quiet-mode on
V <i>n</i>	<i>n</i> =0 or 1	Command Response Mode. 0 : Terse (numeric) command responses 1 : Verbose command responses (Default).
X <i>n</i>	<i>n</i> =0 or 1	Extended Call Progress Result mode. 0 : Turn off extended result codes (Default). 1 : Turn on result codes. This adds the text 19200 to the CONNECT response.
Z	<i>none</i>	Reset the PinPoint-E. Note: This command does nothing if *DATZ=1.
&F	<i>none</i>	Restore Factory Setting.
&W	<i>none</i>	Writes all changed modem settings. If this command is not issued, any modified values will revert back to their previous values at modem reset.
*DATZ= <i>n</i>	<i>n</i> =0 or 1	Enables or disables reset on ATZ. 0 : Normal Reset (Default) 1 : Disable Reset on ATZ

Activation

The preferred method of activating (provisioning) the modem is using the Setup Wizard. However, there are special circumstances when commands may be used instead.



Caution: You may need go into PassThru mode to use some of the commands in this section to activate the PinPoint-E.

TABLE 3. Activation (Provisioning)

Command	Parameters	Details
OPRG= <i>n</i>	<i>n</i> =0 or 1	Enables/disables over-the-air firmware upgrading of the PinPoint-E. 0 : Disables over-the-air programming. 1 : Enables over-the-air programming.
*DEVICEID= <i>n</i>	<i>n</i> =number string	Sets or queries the 64-bit Device ID that is used by the modem to identify itself to the server. The default is a value that depends on the underlying communications technology being used.
*NETPHONE?	<i>none</i> <i>Aucun</i>	The modem's phone number, if applicable or obtainable.
*NETPW= <i>pw</i>	<i>pw</i> =password	The password that is used to login to Verizon's cellular network, when required.
*NETUID= <i>uid</i>	<i>uid</i> =user id (up to 64 bytes)	The login that is used to login to the Verizon's cellular network, when required.

Cellular Network

The PinPoint-E's cellular network is the connection to EV-DO and remote devices or computers.

TABLE 4. Cellular Network (Verizon's EV-DO)

Command	Parameters	Details
*EVDODIVERSITY= <i>n</i>	<i>n</i> =0 or 1	EVDO Diversity 0 : Disabled (Default). 1 : Enable.
*NETALLOWZEROIP= <i>n</i>	<i>n</i> =0 or 1	Allows the displayed IP address in *NETIP to end in zero (ex. 192.168.1.0). 0 : Do not allow 1 : Allow
*NETCHAN?	<i>none</i>	The current active EV-DO channel number.
*NETERR?	<i>none</i>	The EVDO or CDMA network frame error rate.
*NETIP?	<i>none</i>	The current IP address of the modem reported by the embedded hardware module (generally obtained from Carrier). This is the address to which packets can be sent in order to contact the PinPoint-E from the Internet. Note: If there is no current network IP, 0.0.0.0 may be displayed. Refer to *NETALLOWZEROIP if you need to allow the display of an IP ending in a zero.
*NETOK?	<i>none</i>	Checks the EV-DO connection. OK if connected. ERROR if not connected.
*NETRSSI?	<i>none</i>	The current RSSI (Receive Signal Strength Indicator) of the PinPoint-E as a negative dBm value. The same information is displayed with the command S202? .
*NETSTATE?	<i>none</i>	See *NETSTATE?.
*NETWDOG= <i>n</i>	<i>n</i> =minutes	Network connection watchdog: The number of minutes to wait for a network connection. If no connection is established within the set number of minutes, the PinPoint-E resets. Default = 20 min. 0 = Disable.

Local Network and Host Modes

The Local network for the PinPoint-E is the one to which it is connected physically via the Ethernet port to your computer, device, hub, or switch. The PinPoint-E has the ability to provide some NAT (network address translation) to pass communica-

tion from the EV-DO network and the Internet to the local device(s) and network. On the local network, the PinPoint-E acts as a Host.

TABLE 5. Local Network and Host Modes

Command	Parameters	Details
+++ The "+" is ASCII 0x2B. This command is not preceded by AT.	<i>none</i>	AT Escape sequence. If the PinPoint-E is in a data mode (any mode other than PassThru), this command causes the modem to re-enter AT command mode. Note: There must be an idle time (set by S50) on the serial port before and after this command. The detection of +++ is disabled if DAE=1.
MDhh	hh (hex byte) = 00 - normal mode 01 - SLIP mode02 - PPP mode03 - UDP mode04 - TCP mode07 - PassThru mode	Default power-up mode. When the PinPoint is power-cycled, it may enter the mode specified by this command after 5 seconds. On startup, typing ATMD0 within 5 seconds changes the mode to normal (AT command) mode. See also S53 to set the port for UDP or TCP.
S23=[<i>speed</i>],[<i>databits</i>] [<i>parity</i>][<i>stop bits</i>]	<i>speed</i> = 300 1200 2400 4800 9600 19200 38400 57600 115200 230400 <i>databits</i> = 7 or 8 <i>parity</i> = O E N M <i>stopbits</i> = 1 1.5 2	Serial line parameters. The settings take affect after reset. Ex. ATS23=19200,8N1 (sets modem to 19200, etc.) Note: Databits MUST be 8 data bits for PPP mode. Can also be set using &L=[<i>speed</i>],[<i>databits</i>] [<i>parity</i>][<i>stop bits</i>] O=Odd E=Even N=None M=Mark
S50= <i>n</i>	<i>n</i> = tenths of seconds	Data forwarding idle time-out. If set to 0, a forwarding time-out of 10ms is used. (Used in UDP or TCP PAD mode)

TABLE 5. Local Network and Host Modes

Command	Parameters	Details
S51= <i>n</i>	<i>n</i> =0 ASCII code	PAD data forwarding character. 0 : No forwarding character. ASCII code of character that will cause data to be forwarded. (Used in UDP or TCP PAD mode.)
S82= <i>n</i>	<i>n</i> =0 or 2	Enables UDP auto answer (half-open) mode. 0 : Normal mode 2 : Enable UDP auto answer mode.
S83= <i>n</i>	<i>n</i> =0-255	Set or query UDP auto answer idle time-out. If no data is sent or received before the time-out occurs, the current UDP session will be terminated. While a session is active, packets from other IPs will be discarded (unless *UALL is set). Time-out in seconds. 0 : No idle time-out (Default).
S211= <i>n</i>	<i>n</i> =0 1 3	For applications or situations where hardware control of the DTR signal is not possible, the modem can be configured to ignore DTR. When Ignore DTR is enabled, the modem operates as if the DTR signal is always asserted. 0 : Use hardware DTR. (default). 1 : Ignore DTR. 3 : Ignore DTR and assert DSR. This value is deprecated, and it is recommended to use &S to control the DSR instead. When this value is set to 3, &S will automatically be set to 0. See also: &D and &S.
S221= <i>n</i>	<i>n</i> = 0 - 255	Connect Delay Number of seconds to delay the "CONNECT" response upon establishing a TCP connection. <i>OR</i> Number of tenths of seconds to delay before outputting ENQ on the serial port after the CONNECT when the ENQ feature is enabled (see *ENQ).

TABLE 5. Local Network and Host Modes

Command	Parameters	Details
TCPS= <i>n</i>	<i>n</i> = minutes (TCPS=0) or seconds (TCPS=1)	TCP connection time-out (TCPS) units. Specifies a time interval upon which if there is no in or outbound traffic through a TCP connection, the connection will be terminated.
TCPT= <i>n</i>	<i>n</i> = minutes (TCPT=0) or seconds (TCPT=1)	TCP connection time-out (TCPT) units. Specifies a time interval upon which if there is no in or outbound traffic through a TCP connection, the connection will be terminated. This value only affects the TCP connection in TCP PAD mode.
*CTSE= <i>n</i>	<i>n</i> =0 or 1	Clear To Send Enable This feature asserts CTS when there is a network connection. 0 : Disabled (Default). 1 : Enable assertion of CTS when there is network coverage. Note: Flow control (AT\Q) will override this indication, so if you want to use CTS to indicate network coverage, flow control has to be off (AT\Q0). RS232 voltage levels: Positive = Network coverage. Negative = No coverage.
*DU= <i>n</i>	<i>n</i> =0 or 1	The dial command always uses UDP, even when using ATDT. 0 : Dial using the means specified (default). 1 : Dial UDP always, even when using ATDT. Note: When this parameter is set you cannot establish a TCP PAD connection.
*ENQ= <i>n</i>	<i>n</i> =0 or 1	Outputs an ENQ [0x05] after the TCP CONNECT delayed by the Delay Connect Response time (S221). 0 : Disabled (Default). 1 : Enables ENQ on CONNECT.
*HOSTCOMLVL	<i>none</i>	Displays the current signal levels of the host serial port.

TABLE 5. Local Network and Host Modes

Command	Parameters	Details
*HOSTMODE?	<i>none</i>	The current host mode (AT, PPP, UDP, etc.) which the modem is in. If the modem is not in AT mode, telnet into the modem to execute this command.
*HOSTNETMASK= <i>n.n.n.n</i>	<i>n.n.n.n</i> = subnet mask, example 255.255.255.0	Netmask for the host interface. Allows communication with a subnet behind the host interface.
*HOSTPAP= <i>n</i>	<i>n</i> =0 or 1	Use PAP to request the user login and password during PPP negotiation on the host connection. 0 : Disable PAP request (Default). 1 : Takes user login and password from Windows DUN connection and copies to *NETUID and *NETPW.
*HOSTPEERIP = <i>d.d.d.d</i>	<i>d.d.d.d</i> =local or peer IP of modem	Set or query the IP address that can be used to directly contact the PinPoint-E once a Ethernet connection is established. If this value is not specified, 192.168.13.31 will be used. Note: This is not normally used nor needed by user applications. Ethernet
*HOSTPRIVIP = <i>d.d.d.d</i>	<i>d.d.d.d</i> =IP	Set or query the private IP address that is to be negotiated by the Ethernet connection if *HOSTPRIVMODE =1. Ethernet
*HOSTPRIVMODE = <i>n</i>	<i>n</i> =0 or 1	Set or query whether a private or public (network) IP is to be used when the Host initiates a Ethernet connection to the modem. Ethernet 0 : Public (network) IP Mode: When the Host initiates a PPP connection, the host will be given the public IP that was obtained from the OEM module. If the network issues a new IP, the Ethernet connection will be closed (since the IP has changed) and has to be re-initiated. (default). EthernetEthernet 1 : Private IP Mode: When the Host initiates a Ethernet connection, the host will be given the IP address specified in *HOSTPRIVIP. The modem will then perform NAT-like address translation, which shields the Host from network IP changes. Ethernet

TABLE 5. Local Network and Host Modes

Command	Parameters	Details
*UALL= <i>n</i>	<i>n</i> =0 or 1	<p>Accepts UDP packets from any IP address when a UDP session is active. If there is no UDP session active, an incoming UDP packet will be treated according to the UDP auto answer and AIP settings.</p> <p>0 : No effect (Default).</p> <p>1 : Accept UDP data from all IP addresses when in a UDP session.</p>
*UDPLAST= <i>n</i>	<i>n</i> =0 or 1	<p>If enabled, sets S53 to the last accepted IP address through UDP auto answer. This can be used in conjunction with MD3 so that when there is no UDP session, new ethernet host data will cause a connection to be restored to the last IP accepted through UDP auto answer. .</p> <p>0 : Does not change S53 setting. (Default).</p> <p>1 : Set S53 to the last accepted IP.</p> <p>Note: This does not change the S53 setting in NVRAM. If the modem is reset, the original S53 setting will be restored from NVRAM.</p>
*USD= <i>n</i>	<i>n</i> =1-255	<p>Waits the specified delay before sending the first UDP packet and the subsequent UDP packets out to the Ethernet port.</p> <p>0 : No UDP packet delay (Default).</p> <p>Delay in 100ms units, from 100 ms to 25.5 sec.</p>
\Q <i>n</i>	<i>n</i> =0 2 4	<p>Set or query the serial port flow control setting.</p> <p>0 : No flow control is being used.</p> <p>1 : RTS/CTS hardware flow control is being used.</p> <p>4: Transparent software flow control. Uses escaped XON and XOFF for flow control. XON and XOFF characters in data stream are escaped with the @ character (0x40). @ in data is sent as @@.</p>
\APPP	<i>none</i>	Set modem operation to PPP mode.
\ASLIP	<i>none</i>	Set modem operation to SLIP mode. DTR must be asserted (&D0 or S211=1).

PassThru

PassThru Mode is used to communicate directly to the PinPoint-E's internal hardware (OEM module).



Caution: Not all AT Commands can be used while in PassThru mode.

TABLE 6. PassThru Mode

Command	Parameters	Details
<code>\APASSTHRU</code> Note: This mode is not available through the remote AT telnet server.	<i>none</i>	Set modem operation to pass through mode. This will pass any characters received on the Ethernet port directly to the internal hardware module and output any characters from the internal hardware module out the Ethernet port. This allows direct access/configuration of the hardware module. Once this mode is entered, the unit must be physically reset to return to normal operation. Note: It may take up to 30 seconds for the hardware module to respond after CONNECT is output.
<code>*PTINIT=<i>n</i></code>	<i>n</i> =AT command	Any AT Command string to be passed to the OEM module before entering PASSTHRU mode, e.g. AT&S1V1, etc.
<code>*PTREFRESH=<i>n</i></code>	<i>n</i> =0-255 minutes	Number of minutes of inactivity in PASSTHRU mode to resend the *PTINIT string to the hardware module. 0 : Disabled
<code>*RESETPERIOD=<i>n</i></code>	<i>n</i> =0-255 hours	In PASSTHRU mode, modem will be reset after this period if no data has been sent or received. . Value is in hours. 0 : Disabled

Direct Communication

Direct Communication can be used with the PinPoint-E to contact other Internet devices to pass information or other tasks.

TABLE 7. Direct Communication

Command	Parameters	Details
D[method][d.d.d.d][/ppppp] or D[method][@name][/ppppp]	method = P, T, N d.d.d.d = IP address to con- tact name = domain name to contact ppppp = IP port to contact	Dial a connection to a remote IP and Port using <i>method</i> . P - Establish a UDP connection T - Establish a TCP connection N - Establish a Telnet connection ATD - Dial (establish) default connection. ATDP192.168.13.31/2332 - Dial (establish) UDP ses- sion to 192.168.13.31, at port 2332. To end the connection, issue the +++ escape sequence or drop the DTR line (if Ignore DTR S211=0 or &D2).
D <i>continued</i>	<i>see above</i>	The default connetion is set in S53 . If a domain name is specified, the '@' symbol can be used to explicitly indicate the start of the name. For example, if ATDPHONY is issued, this will be inter- preted as dial a UDP connection to "HONY". To dial using the default method to host "PHONY", one would issue ATD@PHONY . If the method, IP address, or port is omitted, the values from S53 are used. If a telnet connection is requested (N) and the port is not supplied, port 23 will be used instead of the value from S53 . Several special dialing numbers exist to make it easy to establish a PPP or SLIP connection with the modem. ATD#19788 or ATDT#19788 will establish a PPP con- nection (see \APPP) and ATDT#7547 will establish a SLIP connection (see \ASLIP). Note: The source port of the session is the Device Port (set by S110 or *DPORT).
PINGd.d.d.d[,n] or PING domain_name[,n]	d.d.d.d = IP address to con- tact n = amount of data to send	Ping the specified IP address. Sends a single ping, returns either OK or ERROR depending on result. Times out in 10 seconds. If <i>n</i> is pro- vided, it specifies the amount of data to send with the ping. If <i>n</i> is not provided, the default, 50 bytes is used.

TABLE 7. Direct Communication

Command	Parameters	Details
<i>S53=[method][d.d.d.d[/ppppp]</i>	<i>method</i> = P - UDP T - TCP N - Telnet <i>d.d.d.d</i> = IP address or name <i>ppppp</i> = the port address	Destination IP address, port, and method. These are used as defaults for the D (Dial) AT command. Examples: AT <i>S53</i> =T192.168.100.23/12345 AT <i>S53</i> =foo.earlink.com Telnet to the specified IP at port 12345. AT <i>S53</i> =192.168.100.23/12345 Query the specified IP at port 12345. AT <i>S53</i> =/12345 Query port 12345.
<i>*DPORT=n</i>	<i>n</i> =1-65535	The modem's Device Port. Can also be set with the command S110 .
<i>*MSCIUPDADDR=name[/port]</i>	<i>name</i> = domain name <i>port</i> =port	Modem Status Update Address - where Name/Port is the domain name and port of the machine where the modem status updates will be sent. The PinPoint-E's status parameters are sent in an XML format.
<i>*MSCIUPDPERIOD=n</i>	<i>n</i> =0-255	Modem Status Update Period - where n defines the update period in seconds. 0 : Disabled.

Telnet

It is possible to communicate with the PinPoint-E across a TCP/IP network. Telnet provides a terminal style connection to the PinPoint-E.



Caution: Telnet is not a secure communications protocol.

TABLE 8. Telnet

Command	Parameters	Details
S60= <i>n</i>	<i>n</i> =0 1 2	Telnet Client Echo Mode. 0 : No Echo 1 : Local Echo (Default) 2 : Remote Echo
*TELNETTIMEOUT= <i>n</i>	<i>n</i> =minutes	Telnet port inactivity time out. By default, this value is set to close the AT telnet connection if no data is received for 2 minutes.
*TPORT= <i>p</i>	<i>p</i> =0-65535	Sets or queries the port used for the AT Telnet server. If 0 is specified, the AT Telnet server will be disabled. The default value is 2332 .

Time/Date

Time and Date in the PinPoint-E is set to UTC (Coordinated Universal Time). Time is expressed in 24-hour format, i.e. 13:23:57 would be 1:23pm. You can set time and date manually or you can have it set automatically with a regular query to an Internet time server (such as time.nist.gov) using SNTP (Simple Network Time Protocol).

TABLE 9. Time and Date

Command	Parameters	Details
*DATE=[<i>mm/dd/yyyy</i>],[<i>hh:mm:ss</i>]	<i>mm/dd/yyyy</i> = month, day, year <i>hh:mm:ss</i> = time in 24-hour notation	Sets and queries the clock in the unit. Either the date and time can be specified, or simply one of the two can be specified in which case the unspecified value will remain unchanged. The date and time are always specified 24-hour notation. Note: The GPS will be used to set the time, in which case any date/time specified will be ignored.
*SNTP= <i>n</i>	<i>n</i> =0 or 1	Enables daily SNTP update of the system time. 0 : Off 1 : On
*SNTPADDR=[<i>d.d.d.d</i>][<i>name</i>]	<i>d.d.d.d</i> =IP <i>name</i> =domain name	SNTP Server IP address, or fully-qualified domain name, to use if *SNTP=1. Note: If blank, time.nist.gov is used.

TABLE 9. Time and Date

Command	Parameters	Details
*SNTPQUERY?	<i>none</i>	The current SNTP time and date.

Friends Mode

Friends Mode can limit access to the PinPoint-E from the Carrier network and the Internet. Friends Mode is a limited form of security.

TABLE 10. Friends Mode

Command	Parameters	Details
FM=[<i>n</i>]	<i>n</i> =0 or 1	Friends Mode - Only allow specified IPs to access the PinPoint-E. 0 : Disable Friends mode 1 : Enable Friends mode - Only packets from friends will be accepted (see below); packets from other IP addresses are ignored.
F _n =[<i>d.d.d.d</i>]	<i>n</i> = Friends list index [0 - 9] <i>d.d.d.d</i> = IP address	Friends mode IP address. 255 = allow any number 0-255 Example: 166.129.2.255 allows access by all IPs in the range 166.129.2.0-166.129.2.255. Note: ATF? will return a list of all the current F _n settings.

DNS

DNS settings in the PinPoint-E allow the modem to use domain names instead of IPs to contact other Internet hosts.

TABLE 11. DNS

Command	Parameters	Details
<i>*DNSn=d.d.d.d</i>	<i>n</i> =1 or 2 <i>d.d.d.d</i> = IP of domain server	Sets the DNS addresses to be returned during PPP negotiation. If the underlying communications network provides DNS addresses, they replace those specified by this command. You can only set *DNS1 and *DNS2.
<i>*DNSUPDATE=n</i>	<i>n</i> =0 or 1	Indicates whether the modem should send DNS updates to the DNS server specified by *DNSUSER. These updates are as per RFC2136. They are not secure and are recommended only for a private network. In a public network, the IP Logger services should be used instead. 0 : DNS updates disabled (Default). 1 : DNS updates enabled.
<i>*DNSUSER=d.d.d.d</i>	<i>d.d.d.d</i> = IP of domain server	Sets a user-provided DNS to query first when performing name resolutions in the modem.

Keepalive

Keepalive (page 21) allows the PinPoint-E to stay connected to the cellular network even when there are periods of inactivity.

TABLE 12. Keepalive

Command	Parameters	Details
<i>*IPPING=n</i>	<i>n</i> =0, 15-255	Set the period to ping (if no valid packets have been received) a specified address (*IPPINGADDR) to keep the modem alive (online). 15 minutes is the minimum interval which can be set for Keepalive. 0 : Disable ping (default) See also *MINXMIT which can override this value.
<i>*IPPINGADDR=[d.d.d.d][name]</i>	<i>d.d.d.d</i> = IP <i>name</i> = domain name	Set the IP address or valid internet domain name for the PinPoint-E to ping to keep itself alive (online). *IPPING must be set to a value other than 0 to enable ping.

TABLE 12. Keepalive

Command	Parameters	Details
*MINXMIT= <i>n</i>	<i>n</i> =seconds	<p>Minimum transmit period enforcement. When set to <i>n</i> seconds, will not let the *IPPING, *PPMINTIME, and the *MSCIUPDPERIOD timers to be set less than <i>n</i> seconds.</p> <p>Note that the *PPTIME can still be set to less than *MINXMIT, but the packets will still be transmitted no more often than the *PPMINTIME.</p> <p>Warning: The *MINXMIT value is can only be set one time and AirLink must be contacted to reset it.</p>

IP Manager

IP Manager (page 15) is a service from AirLink which allows a PinPoint-E with a dynamic IP to be contacted as if it had a static IP by using a Fully Qualified Domain Name.

TABLE 13. IP Manager

Command	Parameters	Details
*DOMAIN=[<i>name</i>]	<i>name</i> = domain name (i.e. eairlink.com)	<p>Domain (or domain zone) of which the PinPoint-E is a part. This value is used during name resolutions if a fully qualified name is not provided and also for DNS updates. This value can be up to 20 characters long.</p> <p>If *DOMAIN=eairlink.com, then when ATDT@remote1 is entered, the fully qualified name remote1.eairlink.com will be used to perform a DNS query to resolve the name to an IP address.</p> <p>Note: Only letters, numbers, hyphens, and periods can be used.</p>
*IPMANAGER <i>n</i> =[<i>name</i>]	<i>n</i> = 1 or 2 <i>name</i> = domain name	<p>Sets a domain name or IP address to send IP change notifications to. Up to two independent IP Manager servers can be set, using either AT*IPMANAGER1 or AT*IPMANAGER2. Updates to a server can be disabled by setting that entry to nothing (i.e. "AT*IPMANAGER1=").</p>

TABLE 13. IP Manager

Command	Parameters	Details
*IPMGRKEY n =[<i>key</i>]	n = 1 or 2 <i>key</i> = 128-bit key in hexadecimal [32 hex characters]	Sets the 128-bit key to use to authenticate the IP update notifications. If the key's value is all zeros, a default key will be used. If all the bytes in the key are set to FF, then no key will be used (i.e. the IP change notifications will not be authenticated). AT*IPMGRKEY1 is used to set the key to use with AT*IPMANAGER1, while AT*IPMGRKEY2 is used to the key with AT*IPMANAGER2.
*IPMGRUPDATE n = m	n = 1 or 2 m =5-255	Sets the number of minutes to periodically send an IP update notification to the corresponding server. This will occur even if the IP address of the PinPoint-E doesn't change. *IPMGRUPDATE1 is used to set the refresh rate to *IPMANAGER1, while *IPMGRUPDATE2 is used with *IPMANAGER2. If the value is set to 0, then periodic updates will not be issued (i.e. IP change notifications will only be sent when the IP actually changes).
*MODEMNAME=[<i>name</i>]	<i>name</i> = domain name (i.e. eairlink.com)	Name of the PinPoint-E (up to 20 characters long) to use when performing IP change notifications to IPManager. The value in *DOMAIN provides the domain zone to add to this name. Example: if *MODEMNAME= mymodem and *DOMAIN= eairlink.com , then the modem's fully qualified domain name is mymodem.eairlink.com . Note: Each modem using IPManager needs a unique name. Two modems cannot be called "mymodem". One could be "mymodem1" with the other as "mymodem". Automatically Generated Names: #I3 - The ESN/IMEI will be used as the name. #NETPHONE - The phone number be used as the name. Note: Only letters, numbers, hyphens, and periods can be used.

Logging

The PinPoint-E allows several different levels of logging.

TABLE 14. Logging

Command	Parameters	Details
*DBG EVTLOGCLEAR	<i>none</i>	Clears the content of the logs in the modem.
*DBG IPLVL= <i>n</i>	<i>n</i> =0 1 2	Sets the logging level for the IP subsystem. 0 : No logging 1 : Log errors (i.e. invalid/corrupt packets, etc.). 2 : Log the header of all received packets. Note that this can quickly exhaust the event log.

Power

The PinPoint-E will put itself into a low-power mode when other configured events occur (page 23).

TABLE 15. Power Control

Command	Parameters	Details
DTRP= <i>n</i>	<i>n</i> =0 1 2	Set or query the DTR power control. 0 : Ignore DTR for power control. 1 : Enter low power mode when DTR is low. 2 : Enter low power mode when DTR is high. See also PTMR .

TABLE 15. Power Control

Command	Parameters	Details
PTMR= <i>n</i>	<i>n</i> = 0-255	<p>Number of minutes after one of the power down events (VLTG or DTRP) happens until the PinPoint enters the low power mode.</p> <p>If DTRP and VLTG are both 0 (zero), this setting does nothing.</p> <p>Note: There is always a minimum of 1 minute between power down event and actual shutdown (to give the modem time to prepare); entering zero will not power down the modem immediately, but after one minute.</p> <p>Note: In the first 5 minutes after modem powers up, power down events are ignored to give the user time to change configurations.</p>
VLTG= <i>n</i>	<i>n</i> =threshold in tenths of volts	<p>Set or query the voltage level at which the PinPoint goes into low power mode.</p> <p>Example: ATVLTG=130 would power down the modem if the voltage goes below 13.0V.</p> <p>0 : Ignore voltage for power control.</p>
*POWERMODE?	<i>none</i>	<p>Displays the current power state/mode. Possible values returned are:</p> <p>Initial - The modem is in the initial 5 minutes since power up, so power down event will be ignored.</p> <p>On - Regular power on, i.e. a power down is not pending.</p> <p>Low Cancellable - Power down is pending but still cancelable if the power down trigger goes away.</p> <p>Low Pending 1 and 2 - Power down is pending, any modem tasks are gracefully preparing for the power down.</p> <p>Low Final - Power down is imminent.</p> <p>Low - Power is down.</p>

External Events (Serial Port Inputs)

The PinPoint-E can be configured to use a digital switch connected to the DTR and RTS of the serial port to trigger an Event (page 23).

TABLE 16. External Events

Command	Parameters	Details
RTSI= <i>n</i>	<i>n</i> =0 or 1	Enable monitoring the RTS signal as in input event. 0 : Disable RTS input monitoring. 1 : Enable RST input monitoring. Note: If RTS is used as an input, hardware flow control cannot be enabled.
*DTRI= <i>n</i>	<i>n</i> =0 or 1	Enable monitoring the DTR signal as in input event. 0 : Disable DTR input monitoring. 1 : Enable DTR input monitoring. Note: If DTR is used as an input, DTR cannot be used for low-power control.
*PPCOM1000= <i>n</i>	<i>n</i> =0 or 1	Enables support for extra inputs from a COM1000. 0 : Disable 1 : Enable
*PPFLUSHONEVT= <i>n</i>	<i>n</i> =0 or 1	Flushes store and forward buffer when an input event (DTR/RTS) occurs. Vide le tampon de la fonction de stockage et de transmission lorsqu'un événement d'entrée (DTR/RTS) survient. 0 : Disable 1 : Enable

GPS

Global Positioning System (GPS) information is gathered by the PinPoint-E for use with Airlink Tracking System (ATS) or other applications needing location updates (page 27).

TABLE 17. GPS

Command	Parameters	Details
GPS <i>n</i>	<i>none</i> or <i>n=1</i>	Send NMEA GPS strings out serial link. ATGPS will cause the NMEA GGA, RMC, and VTG GPS strings to output to the serial port one time. ATGPS1 will cause these strings to be sent out the serial link once per second continuously until ATGPS or until reset. See also *PGPS .
#IG= <i>n</i>	<i>n</i> = seconds	Set or query GPS initialization timer. Time in seconds to wait for GPS acquisition before transmitting at high rates.
#U	<i>none</i>	Immediately issue GPS report to the ATS server IP and port.
*MF= <i>hh</i>	<i>hh</i> = hex value	Set or query GPS format, where <i>hh</i> is a hex value; 8E (transmit Latitude/Longitude/Direction/Velocity/Time in binary) or 8F.
*PGPS= <i>n</i>	<i>n=1</i>	Send NMEA GPS strings out serial link [<i>n=1</i>]. Similar to ATGPS except that the *PGPS value can be saved to NVRAM so that it will continue to operate after resets.
*PPDEVID= <i>n</i>	<i>n=0</i> or <i>1</i>	Whether or not the PinPoint-E should include the 64-bit device ID in its GPS reports. 0 : Disable ID 1 : Enable/display ID Note: This setting MUST be 1 if the modem uses a Dynamic IP.

TABLE 17. GPS

Command	Parameters	Details
*PPDIST= <i>n</i>	<i>n</i> = 1-65535	GPS Report Distance Interval in 100 Meter Units 0 : Disabled
*PPGPSR= <i>n</i>	<i>n</i> =0 0x11 0x12 0x13 0xE0 0xE1 0xF0 0xF1	GPS report type. 0 : Use legacy reports specified in *MF value. Note: Must also have *PPDEVID=0. 0x11 : Standard GPS Report 0x12 : Standard GPS Report + UTC Date 0x13 : Standard GPS Report + UTC Date + RF data 0xE0 : GGA and VTG NMEA reports 0xE1 : GGA, VTG and RMC NMEA reports 0xF0 : TAIP reports 0xF1 : Compact TAIP data
PPIGNOREIP= <i>n</i>	<i>n</i> =0 or 1	When enabled, ignore ATS Server IP (*PPIP) updates in RAP. 0 : Enabled Activée 1 : Disabled
*PPINPUTEVT= <i>n</i>	<i>n</i> =0 or 1	Enable sending input changes as events (different report types). 0 : Disabled 1 : Enabled
*PPIP= <i>d.d.d.d</i>	<i>d.d.d.d</i> =IP	IP address where GPS reports are sent (ATS Server IP). Example: AT*PPIP=192.100.100.100 Note: Also see *PPPORT.
*PPLATS= <i>n</i>	<i>n</i> =0-255	Local ATS - Causes GPS reports to also be sent out the serial link every <i>n</i> seconds, when there is a PPP connection to the serial host established. 0 : Disabled Note: Sends to the PPP peer IP S110 with the Destination Port number S53 .

TABLE 17. GPS

Command	Parameters	Details
*PPLATSEXTRA= <i>n</i>	<i>n</i> =0-7	<p>Have local ATS reporting (LATS) send up to 7 extra copies of a GPS report to the subsequent ports.</p> <p>1-7 : Send GPS report copies to that number of ports.</p> <p>0 : Just the original report is sent (default).</p> <p>Example: If AT*PPLATSEXTRA=7 and the port in S53 is 1000, then GPS reports will be sent to ports 1000-1008.</p>
*PPLATSR= <i>n</i>	<i>n</i> =any of the valid GPS report type	<p>Indicates the type of GPS report to send to the local client (PPP/SLIP peer).</p> <p>See *PPGPSR.</p>
*PPMINTIME= <i>n</i>	<i>n</i> = seconds (0-65535)	<p>Specifies the minimum amount of time between reports generated due to either the time interval (*PPTIME) or the distance interval (*PPDIST). This is useful to limit network traffic and make more efficient use of bandwidth. This can be used in conjunction with store and forward. The minimum value which this setting can take depends on the policies of the carrier.</p> <p>0 : Disabled</p>
*PPODOM= <i>n</i>	<i>n</i> =0 or 1	<p>Enable odometer reporting.</p> <p>0 : Disabled (default)</p> <p>1 : Enabled</p>
*PPODOMVAL= <i>n</i>	<i>n</i> =meters	<p>The PinPoint-E's current odometer value. The value is in meters. Maximum value is approximately 4.3 billion meters (2.5 million miles).</p>
*PPPORT= <i>n</i>	<i>n</i> =0-65535	<p>Port where GPS reports are sent.</p> <p>0 : Use S53 value.</p> <p>See also ATSIP.</p>
*PPSNF= <i>n</i>	<i>n</i> =0 or 1	<p>Set or query the GPS report Store and Forward feature. Store and Forward will cause GPS reports to be stored up if the PinPoint-E goes out of network coverage. Once the vehicle is in coverage the GPS reports will be sent en masse to the server.</p> <p>0 : Disabled</p> <p>1 : Enabled (default)</p>

TABLE 17. GPS

Command	Parameters	Details
*PPSNFB= <i>n</i>	<i>n</i> =0 1 2	<p>Store and Forward Behavior.</p> <p>When *PPSNF=1, the type of Store and Forward behavior is defined by:</p> <p>0 : Normal Store and Forward. Data is stored when the PinPoint-E is out of EV-DO coverage; when the PinPoint-E is in coverage, data is sent to server as soon as possible. This is the default for PinPoint-Es with RAP version 1.3 or lower.</p> <p>1 : Data sent only when polled. Data is stored until polled using the Poll command sent by a server.</p> <p>2 : Grouped Reports. Data is stored until the desired minimum number of reports (see *PPSNFM) has been stored. The data is then sent to the server in groups with at least the specified number of reports.</p>
*PPSNFM= <i>n</i>	<i>n</i> = 0-255	<p>Store and Forward Minimum Reports.</p> <p>Specifies the minimum number of reports that must be stored before they are forwarded to the server. The data is then sent to the server in packets that contain at least this number of reports.</p>
*PPSNFR= <i>n</i>	<i>n</i> =0 or 1	<p>Store and Forward Reliability:</p> <p>GPS reports will be retransmitted if not acknowledged by the server.</p> <p>0 : Disabled</p> <p>1 : Enabled</p>
*PPTAIPID= <i>nnnn</i>	<i>nnnn</i> = TAIP ID (4 characters)	<p>Sets/queries the TAIP ID. This ID is returned in TAIP reports if it has been negotiated with the TAIP client. This value is only used in conjunction with TAIP emulation mode (*PPGPSR=F0).</p>

TABLE 17. GPS

Command	Parameters	Details
*PPTIME= <i>n</i>	<i>n</i> = seconds (1 - 65535)	<p>GPS Report Time Interval</p> <p>Note: Carrier may impose a minimum transmit time.</p> <p>Caution: A report time of less than 30 seconds can possibly keep an RF link up continuously. This will eventually cause the PinPoint-E to overheat and shutdown. An RF resource may continue be tied up to transfer small amounts of data. Generally the RF channel will be released and go dormant in 10-20 seconds of no data sent or received. See also *PPMINTIME, *PPTSV</p>
*PPTSV= <i>n</i>	<i>n</i> =0-255	<p>Timer for Stationary Vehicles.</p> <p>Time interval in minutes that the PinPoint-E will send in reports when it is stationary.</p> <p>For example, if *PPTIME=10, the PinPoint-E will send in reports at least every 10 seconds while it is moving; however, once it stops moving, it will slow the reports down to this *PPTSV value.</p> <p>0 : Disabled</p>
*UDPRGPS= <i>n</i>	<i>n</i> =0 or 1	<p>Set or query GPS stamping of UDP Reliable packets. When set, data received on the host serial port will be encapsulated with the GPS date and time.</p> <p>0 : Disabled (default)</p> <p>1 : Enabled</p>

SNMP (Simple Network Management Protocol)

Simple Network Management Protocol (SNMP) can be used to monitor devices connected to a network for any conditions which warrant administration attention. By default, SNMP uses port 161, however most Internet providers (including cellular) block all ports below 1024 as a security measure.

TABLE 18. SNMP

Command	Parameters	Details
\ACEPW= <i>pw</i>	<i>pw</i> =password	Change the ACE password to a new value. Password is case-sensitive. Default password is 12345. Example: AT\ACEPAW=new123
*SNMPPORT= <i>n</i>	<i>n</i> =0-65535	This controls which port the SNMP Agent listens on. 0 : SNMP is disabled. Port for SNMP agent to listen on.
*SNMPSECLVL= <i>n</i>	<i>n</i> =0 1 2	Selects the security level requirements for SNMP communications as follows: 0 : No security required. SNMPv2c and SNMPv3 communications are allowed. 1 : Authentication equivalent to 'authNoPriv' setting in SNMPv3. SNMPv3 is required to do authentication, SNMPv2c transmissions will be silently discarded. 2 : Authentication and encryption, equivalent to 'authPriv' setting in SNMPv3. SNMPv3 is required to do authentication and encryption, SNMPv2c and SNMPv3 authNoPriv transmissions will be silently discarded. Messages are both authenticated and encrypted to prevent a hacker from viewing its contents.
*SNMPTRAPDEST= <i>host</i> / [<i>port</i>]	<i>host</i> =IP address <i>port</i> =TCP port	Controls destination for SNMP Trap messages. If port is 0 or host is empty, traps are disabled. Traps are sent out according to the SNMP security level (i.e. if the security level is 2, traps will be authenticated and encrypted). Currently, the only trap that can be generated is linkup.

SMTP/SMS

SMTP (Simple Mail Transfer Protocol) is the de facto standard for email transmission across the Internet. The PinPoint-E can send messages using SMTP if it has been configured to use a mail server.

SMS (Simple Message Service) is another way to send messages via your Wireless Service Provider's cellular network.



Caution: Your account with Verizon may not support message sending. For most SMS commands (those not preceded by *), you will need to have the modem in PassThru mode.

TABLE 19. SMTP (email) and SMS (messaging)

Command	Parameters	Details
*NETSMS2EMAIL= [<i>number</i>]	<i>number</i> = SMS/ E-mail server	Specify the SMS/E-mail server number. This is necessary to send an SMS message to an email address .
*SMTPADDR= [<i>d.d.d.d</i>][<i>name</i>]Maximum: 40 characters	<i>d.d.d.d</i> =IP <i>name</i> = domain name	Specify the IP address or Fully Qualified Domain Name (FQDN) of the SMTP server to use.
*SMTPFROM=[<i>email</i>]Maximum: 30 characters	<i>email</i> = email address	Sets the email address from which the SMTP message is being sent.
*SMTPPW=[<i>pass</i>]	<i>pass</i> = password	Sets the password to use when authenticating the email account (*SMTPFROM) with the server (*SMTPADDR). Note: Not required to use SMTP settings but may be required by carrier.
*SMTPSEND=[<i>email</i>][<i>body</i>]]	<i>email</i> = email address <i>body</i> = message body	Sends an email to the address specified, followed by the body of the email message. The email message is terminated and sent by entering a . or Ctrl-Z on an empty line. See also *SMTPSUBJ, *SMYPPFROM, and *SMTPADDR.
*SMTPSTATUS?	<i>none</i>	Returns the status of the last issued SMTP message (*SMTPSEND). If no status is available 0 is returned. Once read, the status is cleared out. The status codes are received from the SMTP server the modem attempted to send the request. Example: 354 = send in progress, 250 = sent ok.
*SMTPSUBJ=[<i>subject</i>]	<i>subject</i> = SMTP message subject	Allows configuration of the default Subject to use if one isn't specified in the message by providing a "Subject: xxx" line as the initial message line.

TABLE 19. SMTP (email) and SMS (messaging)

Command	Parameters	Details
*SMTPUSER=[<i>user</i>]Maximum: 40 characters	<i>user</i> = username	The email account username to authenticate with the SMTP server (*SMTPADDR) for sending email. Note: not required to use SMTP settings but may be required by carrier.

Other

TABLE 20. Other Settings

Command	Parameters	Details
*NUMTOIP= <i>n</i>	<i>n</i> =0 or 1	Convert 12 digit number to IP. 0 : Use as name. 1 : Use as IP.

Example of the MIB trap

```
AIRLINK-MIB DEFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
ObjectNameFROM SNMPv2-SMI
```

```
MODULE-COMPLIANCEFROM SNMPv2-CONF;
```

```
org OBJECT IDENTIFIER ::= { iso 3 }
```

```
dod OBJECT IDENTIFIER ::= { org 6 }
```

```
internet OBJECT IDENTIFIER ::= { dod 1 }
```

```
private OBJECT IDENTIFIER ::= { internet 4 }
```

```
enterprises OBJECT IDENTIFIER ::= { private 1 }
```

```
airlink OBJECT IDENTIFIER ::= { enterprises 20542 }
```

```
general OBJECT IDENTIFIER ::= { airlink 1 }
```

```
common OBJECT IDENTIFIER ::= { airlink 2 }
```

status OBJECT IDENTIFIER ::= { airlink 3 }

gps OBJECT IDENTIFIER ::= { airlink 4 }

-- GENERAL --

phoneNumber OBJECT-TYPE

SYNTAX DisplayString (SIZE (10))

MAX-ACCESS read-only

STATUS current

::= { general 1 }

deviceID OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { general 2 }

electronicID OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { general 3 }

modemType OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { general 4 }

aleosSWVer OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { general 5 }

aleosHWVer OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { general 6 }

modemSWVer OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { general 7 }

modemHWVer OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { general 8 }

-- COMMON --

date OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { common 1 }

otaProgrammingEnable OBJECT-TYPE

SYNTAX INTEGER {

disabled(0),

enabled(1) }

MAX-ACCESS read-only

STATUS current

::= { common 2 }

devicePort OBJECT-TYPE

SYNTAX INTEGER(0..65535)

MAX-ACCESS read-only

STATUS current

::= { common 3 }

netUID OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { common 4 }

netPW OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { common 5 }

requestPAP OBJECT-TYPE

SYNTAX INTEGER {

no(0),

yes(1) }

MAX-ACCESS read-only

STATUS current

::= { common 6 }

destinationAddress OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { common 7 }

destinationPort OBJECT-TYPE

SYNTAX INTEGER(0..65535)

MAX-ACCESS read-only

STATUS current

::= { common 8 }

serialPortSettings OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { common 9 }

serialPortFlowControl OBJECT-TYPE

```
SYNTAX INTEGER {  
    none(0),  
    hardware(2),  
    software(4) }  
MAX-ACCESS read-only  
STATUS current  
 ::= { common 10 }
```

```
-- STATUS --  
ipAddress OBJECT-TYPE  
SYNTAX IpAddress  
MAX-ACCESS read-only  
STATUS current  
 ::= { status 1 }
```

```
netState OBJECT-TYPE  
SYNTAX DisplayString  
MAX-ACCESS read-only  
STATUS current  
 ::= { status 2 }
```

```
netChannel OBJECT-TYPE  
SYNTAX INTEGER  
MAX-ACCESS read-only  
STATUS current  
 ::= { status 3 }
```

```
rsi OBJECT-TYPE
```

SYNTAX INTEGER(-125...-50)

MAX-ACCESS read-only

STATUS current

::= { status 4 }

serialSent OBJECT-TYPE

SYNTAX INTEGER

MAX-ACCESS read-only

STATUS current

::= { status 5 }

serialReceived OBJECT-TYPE

SYNTAX INTEGER

MAX-ACCESS read-only

STATUS current

::= { status 6 }

hostMode OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { status 7 }

powerMode OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { status 8 }

fixObtained OBJECT-TYPE

SYNTAX INTEGER {

no(0),

yes(1) }

MAX-ACCESS read-only

STATUS current

::= { gps 1 }

satelliteCount OBJECT-TYPE

SYNTAX INTEGER

MAX-ACCESS read-only

STATUS current

::= { gps 2 }

latitude OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { gps 3 }

longitude OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS read-only

STATUS current

::= { gps 4 }

END

GPS Message Format Streams

This appendix shows the GPS message streams provided by the PinPoint-E.

NMEA Message Description

The standard GPS data stream provided by the PinPoint-E in raw serial (ASCII) format is comprised of (3) GPS NMEA receiver messages (“sentences”): GGA, RMC and VTG. All NMEA messages start with a dollar sign (\$) followed by a message type identifier. After the identifier, the fields of the messages are comma delimited.

Example taken from PinPoint-E output:

```
$GPGGA,173221.428,3505.1435,N,08037.5669,W,1,04,2.2,242.9,M,46.9,M,,0000*1E
```

TABLE 1. GGA - Global Positioning System Fix Data

Description	Field Contents
Global Positioning System (GPS)	GP
Global Positioning System Fix Data	GGA
UTC (Fix taken at 17:32:21 UTC)	173221.428

TABLE 1. GGA - Global Positioning System Fix Data

Description	Field Contents
Latitude	428,3505.1435
North or South	N
Longitude	08037.5669
East or West	W
Fix Quality (0=invalid, 1=GPS fix, 2=DGPS fix)	1
Number of satellites being tracked	04
Horizontal dilution of precision (metres)	2.2
Antenna altitude above/below mean-sea-level (geoid)	242.9
Units of antenna altitude, meters	M
Geoidal separation, the difference between the WGS-84 earth ellipsoid and mean-sea-level (geoid)	46.9
"-" means mean-sea-level below ellipsoid	
Units of geoidal separation, meters	M
(not applicable to the PinPoint-E)	null field
Differential reference station ID, 0000-1023	0000
Optional checksum field consisting of "*" and two hex digits.	*1E
Represents the exclusive OR of all characters between, but not including, the "\$" and "*".	

Example taken from PinPoint-E output:

\$GPRMC,173219.428,A,3505.1436,N,08037.5669,W,0.09,13.55,040403,,,*2B

TABLE 2. RMC - Recommended Minimum Navigation Information

Description	Field Contents
Global Positioning System (GPS)	GP
Recommended Minimum sentence C Phase	RMC
UTC (Fix taken at 17:32:19 UTC)	173219.428

TABLE 2. RMC - Recommended Minimum Navigation Information

Description	Field Contents
Status A=Active or V=Void	A
(A status of V indicated the GPS has a fix that is below an internal quality threshold, i.e. dilution of precision is too high or an elevation mask test failed)	
Latitude	428,3505.1435
North or South	N
Longitude	08037.5669
East or West	W
Speed over ground, knots	0.09
Track angle in degrees True	13.55
Date (04th of April 2005)	040405
Magnetic Variation, degrees	null field
East or West	null field
Checksum	*2E

Example taken from PinPoint-E output:

\$GPVTG, 308.49,T,,M,0.05,N,0.1,K,*62

TABLE 3. VTG - Vector track and Speed over the Ground

Description	Field Contents
Global Positioning System (GPS)	GP
Track made good and Ground speed	VTG
Track Degrees	308.49
True = T	T
Track Degrees	null field
Magnetic = M	M
Speed Knots	0.05
Knots = N	N
Speed Kilometers Per Hour	0.1
Kilometers Per Hour = K	K

TABLE 3. VTG - Vector track and Speed over the Ground

Description	Field Contents
FAA mode indicator (NMEA 2.3 and later)	null field
Checksum	*62

TAIP Message Description

The TAIP data stream provided by the modem will be raw serial (ASCII) format and is always uppercase.

Examples of TAIP messages:

```
>RPV19277+3508570-0806260100002632;*75<
>RPV19282+3508571-0806260100000432;*7E<
>RPV19292+3508573-0806260300013832;*71<
>RPV19297+3508573-0806260400013432;*7F<
```

TABLE 4. Elements of a TAIP message

Elements	command portion Partie de commande
Begin Message:	>RVP
Seconds into the day (5 Bytes):	19277
Latitude in Degrees (8 Bytes):	+3508570
Longitude in Degrees (9 Bytes):	08062601
Speed in MPH (3 Bytes):	000
Heading in Degrees (3 Bytes):	026
Source of Data (1 Byte):	3
Age of Data (1 Byte):	2
Check Sum:	;*75
End Message:	<

Troubleshooting

Frequently Asked Questions (FAQ) and Solutions

Many of these questions and solutions come from AirLink Support.



Caution: Solutions should only be performed if you are experiencing the specific problem indicated and have the specific modem model number indicated. Some solutions are very specific to model numbers due to differing internal hardware.



What is RSSI? Why is the RSSI for my PinPoint-E negative?

RSSI (Received Signal Strength Indication) is a measurement of the strength, not necessarily the quality, of the received signal strength in a wireless environment. RSSI is used to determine when the signal is below a certain threshold at which point the modem is clear to send (CTS) or to determine the Roaming Threshold (the distance from the access point).

The RSSI is measured in dBm which is the power ratio in decibel (dB) of the measured power referenced to one milliwatt (mW). One milliwatt is zero, therefore less than a milliwatt, common and ideal for cellular communication, is expressed as a negative integer.

AirLink modems optimally have an RSSI value of -60 to -95.



What is the Proper RF Coverage for my PinPoint-E?

Optimal RF coverage (RSSI) for your PinPoint-E is between -60 to -95 DBm. RF coverage between -95 to -105 DBm will generally still register, however functionality at this range can be impeded and registration can become temperamental. Any devices with an RSSI below -105 DBm will likely fail to register on a regular basis.

When addressing RF coverage ensure the antenna choice is appropriate for the device and frequencies required.



What Type of Antenna is Best for my PinPoint-E?

Antennas for cellular communication are generally omni-directional and either dual-band or multi-band. They come in a variety of shapes and mounting configurations to suit several different types of needs.

While AirLink does sell a limited selection of antennas and antenna accessories, these are by no means all that are available or usable with your PinPoint-E. There are several suppliers of cellular accessories with a much wider selection of antennas designed to cater to a broader variety of situations.

Dual- or Tri-band

For cellular communication, the PinPoint-E requires a dual band antenna supporting both 800 MHz and 1900 MHz (1.9 Ghz) bands.



Note: Your PinPoint-E requires either an additional antenna for GPS signal reception or a Tri-band antenna that supports 800 MHz, 1900 MHz as well as a GPS reception. GPS requires an antenna supporting a frequency of 1575.42 MHz either as part of an “all-in-one” tri-band solution or as a separate antenna.



Caution: Single band antennas, such as those formerly used with a CDPD device, generally only support 800 MHz. Using a single band antenna can greatly impede your ability to activate or use your PinPoint-E with Verizon.

Dipole

Dipole is a common antenna type connecting directly to the PinPoint-E and extending out in a single straight wire.

The short dipole antenna (also known as a “rubber duck”) is a good desktop, portable antenna for use in areas with good signal strength and low electrical interference.

Mounts

Antennas can be mounted in a variety of ways (magnet, permanent, suction to a window, sticky tape, etc) which can allow you to move the antenna away from the PinPoint-E with a coax cable between the modem and the antenna allowing the antenna to be placed in a more suitable location for proper cellular reception: outside of a metal cabinet, the trunk lid of a car, a window, etc. A mounted antenna can be placed in locations where the simple, short dipole antenna connected directly to the PinPoint-E may not perform at all.



What do I need to power my PinPoint-E ?

Your PinPoint-E is designed to work either on DC current (generally for use in vehicles) or with an AC adapter (standard wall outlet in the US, Canada, and most other countries). The optimal input voltage is 9VDC to 28VDC with an input current from 90mA to 350 mA.

If the modem is provided an inadequate power supply the following symptoms might be experienced:

- Modem will constantly power cycle while attempting to register
- Modem will register but will power cycle when data is transmitted/received

If these symptoms occur, verify the power supply meets the above mentioned criteria. If an AC adapter is being used; verify it is intended for the AirLink product in question.



Caution: If you previously used AirLink CPDP modems, you may have older power supplies that provide inadequate power and will cause the above mentioned symptoms.



Can I use a portable battery to power my PinPoint-E ?

It is possible to use a portable battery for your AirLink modem, however, you most likely need to make the connector from the battery to the modem yourself. The battery also needs to have enough power to be able to handle the power consumption of the modem. You can contact AirLink Support for a Guide on how to use your AirLink modem with a portable battery.



I'm Having Problems getting my PinPoint-E registered (activated or provisioned) with Verizon, what could be the problem?

There are several error messages that might appear during the registration process:

- No Service
- Network Negotiation Failed
- Network Authentication Failed

These problems are frequently caused by account related issues. The problems potentially involve an incorrectly configured account or incorrectly input/provisioned account information. The best troubleshooting step is to re-provision the PinPoint-E, confirming the account is configured for the proper data plan and modem or simply work with Verizon to create a new account.



Why Can't I reach my PinPoint-E from the Internet? What is a Restricted or Private IP?

On Verizon's network, for security reasons, there are some accounts set up to be restricted to communication only from other devices on their network, called a Restricted IP or a Private IP. If you had two modems on Verizon's network, they could communicate, but your computer, not using Verizon as an ISP can't. You could generally still access the Internet using your PinPoint-E's restricted or private IP because the modem would use a proxy or gateway on Verizon's network.

However, if you need to be able to contact your PinPoint-E (or the devices behind it) directly, instead of a **Restricted IP** (also called **Private IP Non-Routable IP**), you will need to contact Verizon to get your account changed to an **Unrestricted IP** (also called **Public IP**).



What is the difference between Private Mode and Public Mode?

When your PinPoint-E is powered on, ALEOS, acting as a PPP client, negotiates a PPP session with Verizon's network at the conclusion of which it is assigned an IP address by Verizon. How this address is further acted upon by the modem is determined by Private or Public Mode.

Public Mode (*HOSTPRIVMODE=0) :

The IP address assigned by Verizon is passed on to the devices connected to the modem.

If there is a computer or device connected to the AirLink modem's Ethernet port, the IP address assigned by your cellular provider is passed on to the computer or device by the DHCP server in the AirLink modem.

Private Mode (*HOSTPRIVMODE=1) :

The IP address assigned by Verizon is not the address that is assigned to the computer or device connected to the PinPoint-E's serial or Ethernet port during DHCP IP assignment. Instead, the computer or device connected to the PinPoint-E on the Ethernet port is assigned the IP address configured in *HOSTPRIVIP and uses the IP address configured in *HOSTPEERIP to communicate to the modem.



How do I set up Private Mode? How do I connect to my PinPoint-E to my router or to Linux?

Private Mode is at times preferred or required to provide network connectivity to a Linux device, routers, or other devices. Private mode will generally also work with any PC in an environment where there is a need for the PinPoint-E to be configured to work with an internal network.



Note: When connecting the Ethernet port directly to the computer or router, you will need a cross-over cable if the connecting port is not auto-sensing or switchable.

There are four AT commands you will need to set in the modem. You can set them using Wireless ACE (page 10) or Telnet (page 64). The examples shown are from Wireless ACE 3G.

FIGURE 1. Wireless ACE: Private Mode settings

AT	Name	Value	New Value
*HOSTPRIVMODE	Use Private IP	0	1-Use Private IP
*HOSTPRIVIP	Host Private IP	0.0.0.0	192.168.1.8
*HOSTPEERIP	Modem Local IP	192.168.13.31	192.168.1.9
*HOSTNETMASK	Host network mask	0.0.0.0	255.255.255.0

***HOSTPRIVMODE=1** - Private Mode turned on.

***HOSTPRIVIP=[IP address]** - IP address assigned to computer or other device connected directly to the modem (example, *192.168.1.8*).

***HOSTPEERIP=[IP address]** - IP address assigned to modem for local, not cellular, communication (example, *192.168.1.9*).

***HOSTNETMASK=[subnet mask]** - Subnet Mask setting (example, *255.255.255.0*).

The IP addresses configured need to be appropriate for your network. For most internal networks, using the IP range of 192.168.x.x is generally preferred. The first 3 octets need to be the same for all devices on the network (such as 192.168.1.x), but you can use any number from 0 to 254 for the last octet. The last octet for each IP on the network needs to be different. Unless you are instructed to use a different IP range by your Network Administrator, using the 192.168.1.x or 192.168.0.x is recommended.

The *HOSTPRIVIP and the *HOSTPEERIP need to exist on same subnet, the easiest subnet to configure is 255.255.255.0 which allows for 255 IPs on the same subnet. Unless you understand the complexities of subnetting or you are instructed to use a different subnet by your Network Administrator, it is generally safe to use 255.255.255.0. For this subnet, the first 3 sets of numbers (octets) need to be the same with the final number different (such as 192.168.1.x).



Caution: If the IP address of the device or computer connected to the modem is different from the one configured in the modem as the *HOSTPEERIP, communications will fail. If the Subnet Mask is configured differently in the modem than on the computer or device to which it is connected, you may not be able to communicate between them.



What is the COM1000?

The COM1000 is a stand-alone device not made by AirLink but that can be used with your PinPoint-E. There are AT commands for your PinPoint-E AirLink modem which take advantage of some of the properties of the COM1000. The COM1000 is made by SimpleComTools: <http://www.simplecomtools.com/com1000.html> and used in conjunction with AirLink modems: <http://www.simplecomtools.com/wireless.html>.

From SimpleComTools description of the COM1000:

“The COM1000 provides you with a single device that can be seamlessly integrated into LAN, WAN, and WIRELESS projects. Its embedded applications provide quick and easy means of connecting serial devices to IP networks, Internet enabling legacy devices, or integrating remote devices with today's advanced 3G wireless data networks. Its unique blend of Serial and TCP/IP communications, digital and analog inputs, relays, and embedded applications combine to help simplify application integration and eliminate many of today's Machine-to-machine deployment challenges.”



How can I update the PRL (Preferred Roaming List) for my EV-DO modem? I have activated my PinPoint-E but now cannot connect to Verizon, what can be wrong?

If you are experiencing difficulties connecting your PinPoint-E with Verizon after it is activated with the Setup Wizard, the PRL may be out of date.

Wireless ACE



Caution: The modem's version of ALEOS will need to be 200512A or later.

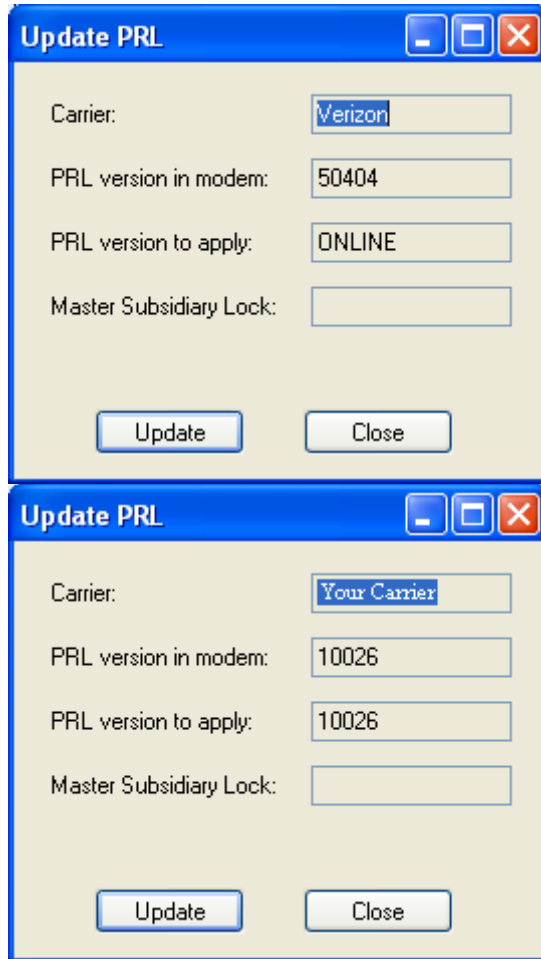
1. Connect to your PinPoint-E AirLink modem using Wireless ACE 3G version 20051201 or later (page 10).
2. On the top Configuration Panel, click the icon for **Update PRL**.

FIGURE 2. Wireless ACE: Update PRL



When you start the Update PRL feature, PRL specific information will be displayed: the Carrier, the current PRL in the modem, the PRL version for the update, and the detected Master Subsidiary Lock (MSL).

FIGURE 3. Wireless ACE: Update PRL interface



Generally the PRL will be updated to the one present in the “PRL” folder of the Wireless ACE installed folder (i.e. C:\Program Files\AirLink\Wireless Ace 3G\PRL). If the PRL version to apply is displayed as **ONLINE**, then the PRL will be updated Over-the-Air (OTA) directly from Verizon.



Attention : If you are using ONLINE updating, your PinPoint-E AirLink modem needs to be able to contact Verizon's your cellular provider's network for the over-the-air process to be successful. You may need to move the modem or connect a different antenna to get a clear strong signal. *If you are connected to your modem remotely, you may incur data charges for the update.*

AT Commands

1. Connect to the PinPoint-E using Telnet (page 64).
2. Type **AT\APASSTHRU** and press Enter to put modem into Pass Thru Mode.
3. Wait at least 30 seconds to initialize the modem.
4. Type **AT!STATUS** and press Enter to check the network status:

Modem has not registered: This can be a transitory state. Wait 30 to 60 seconds and attempt the command again.

Modem is registering: Generally, this indicates the PinPoint-E is attempting to contact Verizon's your cellular provider's network. Wait 30 to 60 seconds and attempt again.

Modem has registered: When you see this message, the PinPoint-E is registered on Verizon's network . Continue on to the next step. .

FIGURE 4. Pass Thru Mode: Modem Status

```
at!status
Current band: Cellular Sleep
Current channel: 466
SID: 40 NID: 1 Roaming: 1
Temp: 27
Pilot acquired
Modem has registered
OK
```

5. Type **AT+GMR** and press Enter. You should get a long output response. Near the end of the output, will be the current five-digit PRL version.

FIGURE 5. Pass Thru Mode: +GMR example

```
AT+GMR
+GMR: S/W VER: BM3.1.10SPAT rosetta R2_1_0_6SB_VZW_S_H F:/SB555STD/ROSETTA 200
3/07/22 14:22:04 .50404. H/W VER: 011
OK
```

-
-
6. Issue **AT+CDV*22899** and Press Enter. You should get “**OK**” as a response. Wait 2 to 3 minutes for the PRL to download and install.
 7. Enter **AT+GMR** again to verify the PRL version change.



Can I track vehicle speed with my PinPoint-E?

GPS has many variables which can affect it's accuracy:

- Are you getting a full view of the sky from the vehicle or antenna location?
- Do you have tall buildings or trees around?
- Is the weather cloudy?
- Other factors may contribute to inaccurate GPS.

The vehicle speed is based on the accuracy of each GPS recorded point which can be off by 10 meters in any direction. What you want to look for is a trend. If a point veers off suddenly in a random direction (i.e. off the road), then it's probably not valid. If you have a sudden low or high speed reading that may also be suspect. Otherwise, if you see consistent acceleration and deceleration, it's probably accurate.

Support web site

The Airlink web site is updated frequently with Setup Wizards, Utilities, FAQs, and other documentation:

<http://www.airlink.com/support>

Contacting Technical Support

For support assistance please email support@airlink.com or call **510-781-9760** Monday through Friday 5 AM to 5 PM Pacific Time (8 AM to 8 PM Eastern Time). Support is not available weekends or holidays.